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THE

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DESCRIPTIONS OF SOME NEW GENERA AND SPECIES OF PHYTOPHAGOUS COLEOPTERA FROM NEW GUINEA.

By Martin Jacoby, F.E.S.

Among the specimens obtained by Mr. A. S. Meek in a comparatively unknown region of New Guinea just behind that part claimed by Germany, and received by Mr. O. Janson, some very interesting new forms are contained, the more conspicuous and remarkable of which I give the descriptions here.

Æsernia Meeki, sp. n.

Metallic purplish or greenish, the antennæ and tarsi bluish-black, last abdominal segments flavous; thorax impunctate, deeply foveolately excavated at the sides, cupreous; elytra deeply punctate-striate and longitudinally costate anteriorly, this portion purplish, posterior half finely punctured, smooth, flavous. Length, 20 mill.

Head metallic green, with a deep central groove, a few punctures are placed near the eyes, the rest impunctate; in front of the clypeus is a deep depression or fovea; antennæ bluish-black, extending to about the middle of the elytra, third and the following two joints of equal length, terminal joints more elongate and slender. Thorax scarcely twice as broad as long, the sides straight, the anterior angles pointed and produced, the disc with a deep longitudinal central groove, cupreous, the sides deeply excavated and foveolate, some of the foveæ extending nearly to the middle of the disc, the latter itself impunctate; scutellum rounded, metallic green, with a small fovea at the apex. Elytra with the middle portion strongly but gradually raised, the sides with a deeper transverse depression before the middle and a smaller one at the latter place, strongly longitudinally costate anteriorly, the striæ between the costæ more or less strongly and closely punctured, the costate portion metallic green, the posterior half of the elytra flavous, finely punctured, and flat; below and the legs metallic green, the last three abdominal segments flavous.

Hab. Owgarra, New Guinea (A. S. Meek).

At once distinguished from any of its allies by the partly costate, partly smooth elytra. Each of these has about eleven round costa (counting the short subsutural one); the interstices are deep and narrow, excepting the last, in which two or three much broader, elongate, deep grooves separate the costa from the lateral margins. *A. formosa*, Gestro, has almost similarly sculptured elytra, but these have a flavous transverse band below the middle, and the apex is metallic green, like the rest of the surface.

Æsernia costata, sp. n.

Blackish, the femora and tibiæ flavous; thorax deeply foveolate at the sides, impunctate; elytra with numerous highly-raised, partly-connected longitudinal costæ, black, the apical third portion flavous, finely punctured. Length, 20 mill.

Head impunctate, black, deeply foveolate between the eyes; antennæ black, the fourth joint about one-half longer than the third, following joints not longer. Thorax of the same shape as in *A. Meeki*, but somewhat more elongate, the anterior margin deeply concave, entirely impunctate, the disc without a central groove, the sides deeply longitudinally excavate, the excavation irregularly foveolate, another single fovea is also placed near the base at each side; scutellum ovate, impunctate. Elytra with their greatest convexity rather before the middle, with three transverse depressions at the sides, the first of them the deepest, the anterior two-thirds very strongly longitudinally costate, the costæ sometimes transversely connected and separated at the sides by deep elongate foveæ, the apical third portion flavous, finely punctured, with an arrangement of rows here and there. Below bluish-black, the last two abdominal segments flavous; legs elongate and slender, flavous, the tarsi black.

Hab. Owgarra, New Guinea (A. S. Meek).

Quite distinct from *A. Meeki* in the much more pronounced and longer elytral costæ and their foveolate interstices, in the differently sculptured thorax, and the general coloration.

PALÆOSASTRA, gen. nov.

Elongate, subcylindrical, and robust, the head short and broad, antennæ very long and slender, extending to the apex of the elytra, the basal joint elongate, club-shaped, the second small, the third more than twice as long, the others very elongate, slightly curved, the apex of each produced. Thorax short and transverse, twice as broad as long, the sides nearly straight, posterior margin oblique near the angles, the disc with a lateral and basal depression. Scutellum broad. Elytra wider at the base than the thorax, broad and elongate, slightly widened posteriorly, closely punctured, their epipleuræ narrow and gradually disappearing below the middle. Legs long and slender, the tibiæ not sulcate, all armed with a long spine, the metatarsus of the posterior legs longer than the following joints together, claws appendiculate: prosternum invisible between the highly-raised coxæ, the anterior cotyloid cavities open.

This genus has most of the structural characters of the

Luperinæ of Chapuis' arrangement, but is altogether of entirely different aspect and shape, being broad, robust, and elongate, somewhat of the shape of some species of *Oides*. The extremely long antennæ, very slender and elongate legs, shape of the thorax, and the peculiar subæneous coloration will at once distinguish the genus from any of the tribe Galerucinæ.

Palæosastra gracilicornis, sp. n.

Obscure æneous, the antennæ, tibiæ, and tarsi and the abdomen black, lower portion of the femora fulvous; thorax closely punctured; elytra fuscous-æneous, extremely closely and finely punctured. Length, 16 mill.

Head impunctate, the vertex rather convex, frontal elevations elongate, trigonate, clypeus broad, rugosely punctured, eyes large, oblong, antennæ black, extremely long and slender; the third joint more strongly curved at the apex than the following ones. Thorax with the angles produced, subtuberculiform, the space in front of the posterior angles thickened, the surface distinctly and closely punctured, the sides with a round fovea, the base with a broader, more shallow depression. Scutellum punctured. Elytra much wider at the base than the thorax, the shoulders rounded, the entire surface very closely punctured, the punctures scarcely finer than those of the thorax, except towards the apex. The breast obscure metallic, like the elytra, abdomen blackish. Legs long, thin and slender, femora fulvous, their apex and the tibiæ and tarsi black.

Hab. Owgarra, New Guinea (A. S. Meek).

PAPUANIA, gen. nov.

Oblong-ovate, strongly convex and widened posteriorly, antennæ long and filiform, the second joint short, the third slightly shorter than the fourth, the following joints equal. Thorax subquadrate, strongly constricted at the base, transversely sulcate. Scutellum slightly longer than broad, convex. Elytra much wider at the base than the thorax, deeply transversely depressed anteriorly, the posterior portion strongly widened and convex, their epipleuræ broad at the base, entirely disappearing below the middle. Legs long and slender, the tibiæ unarmed, the metatarsus as long as the following three joints together, claws bifid; prosternum invisible between the coxæ, the anterior cotyloid cavities closed.

The genus proposed here for the reception of this insect has very much the appearance of the Indian genus Agetocera in regard to the thorax and the elytra, but the very long and slender antennæ, unarmed tibiæ, and the structure of the elytral epipleuræ, as well as that of the anterior cotyloid cavities, differ entirely from the last-named genus, and do not fit in any group of Chapuis' arrangement of genera.

Papuania impressipennis, sp. n.

Fulvous, the antennæ (the basal joints excepted), the breast and legs black; thorax impunctate; elytra metallic greenish-blue, deeply

depressed below the base, strongly convex posteriorly, finely and closely punctured; abdomen rufous. Length, 12 mill.

Head about as long as broad, impunctate, transversely grooved between the eyes, the latter rather small, frontal elevations distinct, trigonate, clypeus strongly convex, triangular, palpi with the penultimate joint thickened; antennæ long and slender, black, the lower three joints fulvous. Thorax slightly wider than long, the basal portion strongly narrowed, its sides straight, but rather strongly and suddenly widened towards the apex, the disc with a transverse sulcus at the middle, which is deeply impressed at the sides but shallow at the centre, the surface entirely impunctate. Scutellum black. Elytra metallic greenish or blue, deeply transversely depressed below the base, the depression bounded at the sides by a longitudinal ridge, the punctures more strongly marked within the cavity and at the sides than at the rest of the disc. Legs black; abdomen reddish-fulvous, the last segment in the male, incised at each side, the median lobe excavated, not broader than long, the corresponding segment in the female entire, obtusely rounded.

Hab. Owgarra, New Guinea (A. S. Meek).

THE INSECTS OF THE NORTH CORNISH COAST.

By A. E. Gibbs, F.L.S.

Those who have read Mr. Baring Gould's novel 'In the Roar of the Sea' will be familiar with the name of Polzeath, the little hamlet on the River Camel, where the heroine of the story lived. From a perusal of this interesting work of fiction can be gained an idea of the wild and rocky nature of the coast-line which guards the land from the fury of the Atlantic breakers. Nestling at the head of a sandy cove called Hayle Bay, at the foot of hills which shield it from the fury of the winter storms, Polzeath in summer is a delightful spot at which to spend a holiday. To the north-west, at the mouth of the river, rises the mighty headland of Pentire, while on the other side of the water the steep cliffs of the Stepper are seen, and beyond them is the fine promontory of Trevose, crowned with a lighthouse. A building estate is being laid out on the cliffs at Pentireglaze, where half a dozen convenient houses have been erected. Polzeath is a veritable naturalist's paradise, miles away from the nearest station, and here, during the summer of 1905, I settled for a few weeks' insect hunting. The South-Western express from Waterloo landed us at Wadebridge about five o'clock in the afternoon of July 1st, and it was nearly two hours later when, after a drive which despite the rain proved very interesting, we reached our destination. The large box containing our entomological apparatus, tins of syrup for treacling (for it was necessary to remember that we were six or seven miles from the nearest shop), and

other necessary impedimenta, had arrived safely by the carrier's 'bus which travels to and fro from Wadebridge three times a week; so, relieved of anxiety on that score, we set out to view the land. But the rain continued to fall, and darkness set in early, and we had to abandon the idea of spreading the alluring sweets. The weather had improved by the next morning, but everything was still very wet, and no Lepidoptera were to be met with. The wild parsley which grows abundantly on many of the stone walls was, however, being visited by Diptera, *Leptogaster cylindrica*, *Chrysotoxum elegans*, and *C. festiva* being specially noticeable. Close by our house a pretty little bay called Pentire Haven ran inland, and from its head a cart-track had been constructed along the hill-side. A tiny stream trickled down the valley, and by its side a small enclosure had been planted with oats. A convenient row of posts was discovered between the field and the road, and these afforded a most welcome spread for our treacle patches. The large heads of various umbelliferous flowers, and, later on, the abundant clumps of ragwort, also proved very useful for sugaring purposes. It was with some anxiety we spread the treacle, wondering what these bare, treeless, wind-swept rocks would yield; but all doubts were quickly set at rest. As soon as the light of the lantern was thrown on the first post we were delighted to see that it was covered with moths struggling for places, and crowding round every runnel and splash of treacle. *Agrotis exclamationis* was there in its thousands, with a fair sprinkling of *Axilia putris*, *Agrotis corticea*, *Noctua plecta*, and *Acronycta rumicis*, and, above all, *Agrotis lunigera*. Never having taken this last-named insect before, the presence of beautifully fresh specimens of both sexes afforded us much pleasure. It is generally stated that *A. lunigera* is only to be taken on steep and dangerous cliffs, in places where sugaring is by no means a safe occupation; but its abundance at Polzeath showed that this is not invariably the case. Here it was found on posts and flower-heads in the valley at some distance from the seashore, and so abundantly did it occur, that one evening's work yielded upwards of fifty specimens. A long and very varied series was the result of the month's collecting, enabling us not only to enrich our own cabinet, but to supply correspondents as well. At dusk *A. lunigera* is to be taken on the wing on the steep hill-sides, flying over woodsage (*Teucrium scorodonia*), which grows luxuriantly hereabouts, and whose blossoms are very attractive to insects. On July 6th *A. lucernea* was taken in the net, only one other specimen of this insect being seen during our visit, and that one came to light in the house. We worked hard at bloom of *Silene maritima* for *Dianthœcia barrettii*, which surely ought to occur at Polzeath, but our efforts were not successful. Most of the sugaring was done in the little valley, visits to more distant spots proving less remunerative.

At the end of Hayle Bay, beyond the village of Polzeath, a small wood clothed the steep side of the valley, and, as there were practically no other trees in the neighbourhood, we concluded that here we should do our best work; so on July 5th, which was a very promising evening, in company with Mr. P. J. Barraud, of Bushey Heath, who was staying with me, I visited the spot, and sugared with great hopes of success; but the only insect which rewarded our exertions was a very light coloured specimen of *Aplecta nebulosa*. A second visit to this locality at the end of the month proved equally unremunerative. About the end of the first week of July *Lithosia complana* began to appear, and a short series was secured, but it was soon over, its place being taken by *L. lurideola*. *L. complana* was taken at sugar, principally in the heads of ragwort, and also while dusking on the hill-side; but this latter method of work proved very trying on account of the steep and broken nature of the ground, which resulted in not a few tumbles and much practical acquaintance with the business ends of the spines of *Ulex europæus*.

As the month advanced *Triphæna interjecta* and *Caradrina taraxaci* became two of the commonest insects, frequenting chiefly the sugared heads of ragwort, and, in the case of the latter species, the flowers of woodsage. An occasional specimen of *Bryophila muralis* was taken on the posts, but diligent search in the daytime on rocks and walls failed to reveal its presence, the only specimens seen being at sugar. As July wore on *Agrotis exclamationis*, of which one or two nice varieties had been captured, gave way in point of numbers to *Apamea didyma* in great variety; but during the second half of the month sugaring was much less effective than was the case at first, the wonderful abundance of Noctuæ on those early nights being a thing to be long remembered.

Not very much was accomplished among the Lepidoptera in the daytime. *Pararge egeria* was to be seen during the first week in worn condition, but when, at the beginning of September, I returned to Polzeath for a few days, the second brood was flying, and in fine condition; but unfortunately I then had no net, and so could not secure a series. Other abundant day-flyers were *Vanessa io*, *V. atalanta*, and *Pararge megæra*. A worn pair of *Sesia musciformis* were secured on July 4th, and a third specimen was taken by Mr. Barraud on the 7th. The sea-thrift (*Armeria vulgaris*), which it frequents, is very common, and doubtless the insect might be taken abundantly in June.

Some little work was done in other orders. Odonata were represented by *Sympetrum striolatum* (abundant), *Ischnura elegans*, *Libellula depressa*, *Cordulegaster annulatus*, and *Calopteryx virgo*. Among the Aculeates may be mentioned *Odynerus parietinum*, *O. trifasciatus*, *Cœloxys acuminata*, *Cerceris arenaria*, *Ammophila sabulosa*, *Crabro vagus*, *C. cibrarius* (plentiful at

bramble-flowers on the sand-hills at St. Enodoc), and *Panurgus ursinus*. The sawflies included *Allanthus scrophulariæ*, *Selandria serva*, and *Abia sericea*. The great green grasshopper (*Phasgonura viridissima*) was frequently seen, coming to sugar in its immature stage during the first half of our visit, and again later on as a perfect insect.

Diptera were most plentiful round the little wood already referred to, and in the boggy meadows immediately below it. Here *Asilus crabroniformis*, *Dysmachus trigonus*, *Anthrax paniscus*, *Volucella bombylans*, *Eristalis intricarius*, and *Mesembrina meridiana* were taken, while *Chrysops cæcutiens* and *Hematopota pluvialis* made work anything but pleasant, especially for my companion, who was much troubled by their unwelcome attentions. Of the last named species one male was secured by sweeping, which may be worth recording, for common as the females are, the males are not so often met with. I took a male in the same way last year in Lincolnshire.

The following is the list of the Lepidoptera taken at Polzeath :—

RHOPALOCERA.—*Pieris brassicæ*, *P. rapæ*, *P. napi*, *Argynnis paphia*, *Vanessa io*, *V. atalanta*, *Pararge egeria*, *P. megæra*, *Epinephele ianira*, *E. tithonus*, *Aphantopus hyperanthus*, *Cœnonympha pamphilus*, *Polyommatus phlæas*, *Lycæna icarus*, *Hesperia thaumas*, *H. sylvanus*.

HETEROCERA.—*Sesia musciformis*, *Zygæna filipendulæ*, *Lithosia lurideola*, *L. complana*, *Euchelia jacobææ*, *Lasiocampa quercus*, *Thyatira derasa*, *T. batis*, *Bryophila muralis*, *Acronycta* (?) *psi*, *A. rumicis*, *Leucania conigera*, *L. lithargyria*, *L. comma*, *L. impura*, *L. pallens*, *Axylia putris*, *Xylophasia lithoxylea*, *X. monoglypha*, *Neuria reticulata*, *Mamestra brassicæ*, *Apamea didyma*, *Miana strigilis*, *M. fasciuncula*, *M. literosa*, *M. bicoloria*, *Caradrina morpheus*, *C. alsines*, *C. taraxaci*, *C. quadripunctata*, *Agrotis puta*, *A. suffusa*, *A. segetum*, *A. lunigera*, *A. exclamationis*, *A. corticea*, *A. nigricans*, *A. tritici*, *A. lucernea*, *Noctua plecta*, *N. c-nigrum*, *N. festiva*, *N. rubi*, *Triphæna interjecta*, *T. orbona*, *T. pronuba*, *Amphipyra tragopogonis*, *Euplexia lucipara*, *Phlogophora meticulosa*, *Aplecta nebulosa*, *Hadena adusta*, *H. dentina*, *H. oleracea*, *H. pisi*, *Cucullia umbratica*, *Gonoptera libatrix*, *Plusia chrysitis*, *P. gamma*, *Chariclea umbra*, *Hypena proboscidalis*, *Uropteryx sambucaria*, *Epione apiciaria*, *Crocallis elinguaria*, *Gnophos obscuraria*, *Pseudoterpna pruinata*, *Hemithea strigata*, *Acidalia dimidiata*, *A. dilutaria*, *A. marginepunctata*, *A. remutaria*, *A. imitaria*, *A. aversata*, *Abraxas grossulariata*, *Emmelesia alchemillata*, *E. decolorata*, *Eupithecia oblongata*, *E. absinthiata*, *E. pumilata*, *Melanthia ocellata*, *Melanippe rivata*, *Anticlea rubidata*, *Coremia ferrugata*, *C. unidentaria*, *Camptogramma bilineata*, *Eubolia limitata*, *Cledeobia angustalis*, *Aglossa pinguinalis*, *Scoparia dubitalis*, *S. mercurella*, *Nemeophila noctuella*, *Pyrausta purpuralis*, *Herbula cespitalis*, *Ebulea crocealis*, *Stenia punctalis*, *Œdematophorus lithodactylus*, *Homœosoma binævella*, *Phycis subornatella*, *Apomia sociella*, *Aspis udmanniana*, *Trycheris aurana*, *Xanthosetia hamana*, *Argyrolepia badiana*, *Blabophanes rusticella*, *Depressaria costana*, *D. arenella*, *D. alstrœmeriana*, *D. yeatiana*, *D. applana*, *D. badiella*, *Œcophora lambdella*.

PREOCCUPIED GENERIC NAMES IN THE HOMOPTEROUS FAMILY FULGORIDÆ.

By W. L. Distant.

In working out the Indian Fulgoridæ for my third volume on the Rhynchota of British India, I have been compelled to propose new names for some genera which bear names previously used in zoology. As these are not yet published, it is perhaps better to detail them at once, lest other substitutions should be made, and further synonymy be created:—

Vekunta, n. nom.
Temesa, Melich., Hom. Faun. Ceylon, p. 40 (1903).—Moll.

Kinnara, n. nom.
Pleroma, Melich., Hom. Faun. Ceylon, p. 41 (1903).—Spong. and Ins.

Vinata, n. nom.
Erana, Walk., J. Linn. Soc. Zool. i. p. 151 (1857).—Aves.

EPIBLEMA IMMUNDANA, F. R.

By Eustace R. Bankes, M.A., F.E.S.

Referring to my remarks on *Epiblema immundana* (Entom. xxxviii. 311–12), I have just come across an interesting note by Mr. A. Balding in Ent. Mo. Mag. xxi. 276 (1885), in which he says that he bred this species in April from larvæ collected—evidently in the Wisbech district—in catkins (of alder; see Ent. Mo. Mag. xxi. 206) in the previous November, some of the larvæ having pupated during November, and others in the end of January. This proves that the eggs laid by the second-brood moths hatch out in the autumn, as stated by Sorhagen (Kleinschmet. d. M. Brandenburg, 112), but I imagine that such early pupation is abnormal, for even in this mild climate larvæ are obtainable in plenty, in catkins of alder, in the end of February and beginning of March.

Mr. Balding (Ent. Mo. Mag. xxi. 276) incidentally mentions that two out of his last five first-brood moths were "devoid of the white blotch" (the omission of any such note about the first two makes it probable that they *had* the white blotch), thus showing that the typical white-blotched form, for which Mr. Thurnall has looked in vain in the first generation, outnumbered the dark-blotched var. *estreyeriana*, Gn. In my own experience of the early brood (see Entom. xxxviii. p. 311) the latter slightly outnumbered the former.

Norden, Corfe Castle: Dec. 12th, 1905.

LEPIDOPTERA IN EAST SUFFOLK, 1905.

By Rev. A. P. Waller, B.A.

I have headed my notes "Lepidoptera in East Suffolk," but in reality my observations, with few exceptions, have been confined to a small district situated near Woodbridge, and in close proximity to the tidal waters of the River Deben. The past season in this restricted locality, which I have now worked regularly for six years, and on and off for a much longer period, has been marked by the entire absence of many species I usually expect to see, and by the occurrence of several insects which are quite new to me. Additions to my local list were *Hepialus sylvanus*, *Euchelia jacobææ* (imagines and larvæ), *Biston hirtaria*, *Noctua baia*, *Tethea subtusa*, *Cleora lichenaria*, *Chesias rufata* (1), *Herminia cribralis*, *Schœnobius mucronellus*, &c. The absentees included *Vanessa polychloros* (always uncertain as to numbers, but generally occurring), *Thecla rubi* (sometimes abundant), *Mamestra anceps*, *Apamea basilinea*, *A. gemina*, *Grammesia trigrammica*, *Agrotis saucia*, *Noctua festiva*, *Aplecta advena* (often plentiful), *Mania typica*, &c. I have seen neither *Colias edusa* nor *Sphinx convolvuli*, and I do not remember noticing *Vanessa cardui*, whilst only one pupa of *Acherontia atropos* has been brought to me from the potato fields.

Referring to my diary, I see the first note I have is the appearance, on March 1st, of *Hybernia rupicapraria* and *H. marginaria* at light. Later in the month the common Tæniocampids came freely to sugar. I had no sallows within a mile or more of my house and so, one evening, having procured a bundle of sallow-bloom, I placed it about my garden. Moths came to this in some plenty, whilst the sugar, which the previous night had been well tenanted, was entirely deserted. Atmospheric conditions may have had something to do with it, as the night was colder, and the sugar-patches more exposed to the wind; but the preference for the sallow was certainly very interesting to notice.

Nothing of much note occurred in April. A few larvæ of *Ellopia fasciaria* and *Thera firmata*, with numerous *T. variata*, were beaten from Scotch fir, and a score or more *Cirrhœdia xerampelina* from ash. On April 12th I boxed a fine specimen of *Nola cristulalis* from a tree-trunk, a much earlier date than I have taken it before. During May I did very little collecting, but at the latter end of the month I noticed *Eupœcilia vectisana* flying freely amongst armeria on the saltings; and I secured a single example of *Epichnopteryx reticella*, which species I first recorded for this county in 1903. This insect seems to be extending its range northward, for I hear that it has been taken this year near Southwold. June in the early days was not very eventful, with the exception of seeing *Euchelia jacobææ*, *Adela degeerella*,

and *Heliaca tenebrata*, the two former both new to me here, and the latter only observed once before. On the 16th I made a journey beyond my usual district, to the sea-coast a little to the north of Felixstowe, Mr. G. P. Hope having informed me that the larvæ of *Malacosoma* (*Bombyx*) *castrensis* were to be found in large numbers, as also the imagines of *Setinia irrorella* just emerging and in fine condition. This latter I failed to discover in the short time at my disposal, but the larvæ of *M. castrensis* were in immense quantities, feeding on *Plantago maritima*. One might have taken many hundreds of nearly full-grown caterpillars, not to mention webs of those in the earlier stages of growth. Out of about a hundred which I brought home some suffered from the journey, but a good proportion fed up well on apple-leaves sprinkled, as Newman suggests, with salt and water. They also fed on chrysanthemums, but seemed to prefer apple. The result was a nice and variable series of some forty moths, two-thirds of which were males. Both *M. castrensis* and *Setinia irrorella* are very interesting insects for this county, as I believe there has been only about one record of their occurrence during many years past. The end of June brought various geometers, of which I may mention *Acidalia trigeminata* (this species is much commoner and of more regular occurrence than *A. bisetata*, which I did not observe at all), *Coremia quadrifasciaria* (a few, usually scarce, but occurred last year in some plenty), *Melanippe unangulata* (I have not seen this for some years), *Phibalapteryx tersata*, *P. vitalbata* (rare here), *Cidaria picata*, &c. *Scoparia basistrigalis* was common both at light, in my trap, and at rest on tree-trunks, and *Agdistis bennettii* and *Schœnobius mucronellus* were taken in the light-trap. In seed-pods of the common yellow flag (*Iris*) I found a few larvæ of *Tortrix costana*, and also two small strawberry-coloured larvæ which I have been unable to identify, and which unfortunately escaped. Dusking by the reed-beds and near the river, *Acidalia emutaria* and *Herminia cribralis* (five) were netted, and two beautiful specimens of *Senta maritima* var. *wismariensis*. Subsequent work in July produced a fine series of *S. maritima*, including varieties—*nigro-striata* and *bipunctata*. Dusking by the reeds in July also rewarded me with long series of *Leucania straminea*, *Calamia phragmitidis*, *Nudaria senex*, and *Chilo phragmitellus*. *L. straminea* was on the wing until quite the latter end of the month, and the later specimens were in much better condition than those which I captured earlier. This species flies most freely on a windy evening, which of course makes netting it a matter of some difficulty. On July 4th, as I have already recorded in the August number of the 'Entomologist,' *Leucania favicolor* flew into my room, attracted by the light. This specimen is the typical buff form. On July 20th a second came to sugar, the golden yellowish form var. *lutea*, Tutt. On the 27th and 28th I

secured two more at sugar, both these being the red form var. *rufa*, Tutt. Unfortunately these last, which I took on sugared flowers of dock, are not in very good condition. I remember it was on sugared dock that I captured two or three of the red form in 1901, though at the time I supposed them to be a variety of *L. pallens*. Here, I may say, I have to thank Mr. Gervase Mathew, R.N., for most kindly allowing me to see his unique series of this interesting insect, and also for confirming the identity of my own.

Towards the end of July sugar began to attract moths in large numbers, but, with a few bright exceptions, the better noctuids were wanting. A thing that always strikes me is that each season one or two species seem especially to assert themselves. Last year, for instance, the three Plusiids *chrysites*, *iota*, and *gamma* appeared in unusual quantities. I shall not easily forget how the last-named swarmed one evening in early June at the flowers of sweet rocket. The wind suddenly veered round from east to west, and as suddenly my garden seemed alive with *P. gamma*, where, half an hour before, not one was to be seen. This year I have been interested in the abundance of *Hydrœcia nictitans* and *Agrotis tritici*, neither of them, as a rule, common insects here. Both came in profusion to light and sugar. I had no idea before that *H. nictitans* was such a variable insect; a long series included var. *paludis* and many other nice forms. During the early part of August I was away from home, and when I returned, though sugar still proved attractive, nothing of any special note turned up. There was a very large second brood of *Leucania pallens* out, so I worked hard, hoping for some more *L. favicolor*, but with no success. In September I had little or no leisure, as I was busy changing my residence. On the 29th a specimen of *Vanessa antiopa* was brought to me, this I have already recorded. The cold winds of October were not very enticing, so that autumn collecting was more or less of a failure.

I do not know what verdict other entomologists will pronounce upon the season 1905, good or bad. I am content to call it a very interesting one.

Waldringfield Rectory, Woodbridge.

PHALONIA BADIANA, Hb.

By Eustace R. Bankes, M.A., F.E.S.

I have no doubt that Mr. Thurnall's suggestion (Entom. xxxviii. 309–10), that Sorhagen (Kleinschmet. d. M. Brandenburg, 86) erroneously attributed Machin's statement about *P. badiana* (Entom. vi. 283) to "Maling," owing to notes by both writers having appeared on the same page, is correct. The

mistake may have arisen, as he thinks likely, from confusion between the two somewhat similar names, but it seems to me still more probable that Sorhagen entirely overlooked Machin's name, which is given without address or date and in a singularly inconspicuous position, and, at a cursory glance, took the whole page as a contribution from Maling, whose name and address are printed at the foot of it. It occurred to me some time ago that Sorhagen must have written "Maling" for "Machin," and a footnote to my paper was penned to this effect, but having only in mind Machin's later note (Entom. xx. 110–11), which proved to have been published the year *after* Sorhagen's work, I had no explanation to offer of how such a mistake could have arisen, and substituted the footnote, published in Entom. xxxviii. 276, for the original one.

Norden, Corfe Castle: Dec. 11th, 1905.

DESCRIPTION OF A NEW FIJIAN SPECIES OF CICADIDÆ.

By W. L. Distant.

Subfam. Cicadinæ.

Div. Dundubiaria.

Little is known of the Cicadidæ found on these islands, but from what little is known, the species are large and distinct. More than twenty years ago I described two species from the Fijis, and have not seen another specimen from the islands save the two which prompt this note.

Sawda ? vitiensis, sp. n.

♀. Head and pronotum ochraceous; front of head with a central line more broadly bifurcating anteriorly, pale castaneous; area of the ocelli piceous-black; pronotum with the anterior margin and the fissures pale castaneous, and with a central fascia only denoted by its darker margins, which are more defined posteriorly; mesonotum piceous-brown, the lateral margins and two discal fasciate lines ochraceous, four obconical spots only denoted by their darker margins, of which the two central are shortest; abdomen above piceous-brown, its base and lateral areas transversely palely pilose; body beneath and legs ochraceous; base and apex of face, and bases and apices of femora and tibiæ, brownish or piceous; tegmina and wings hyaline, the venation ochraceous, becoming piceous towards apical areas, tegmina with the costal membrane brownish ochraceous, basal venation of the upper ulnar area pale ochraceous, transverse veins at bases of second, third, fourth, fifth, and seventh apical areas infuscated, and a series of small

iscous spots at apices of longitudinal veins to apical areas; head as ong as breadth between eyes, and including eyes much narrower than ase of mesonotum, anterior margins of vertex of head almost at right ngles to front; greatest breadth of tegmina about one-third of length. Long. excl. tegm., ♀, 37 millim.; exp. tegm., 125 millim.

Hab. Fiji Islands (Crowley Bequest, Brit. Mus.).

This description is based on two female specimens. The species conforms to all the characters of the genus *Sawda*, with the exception of the more elongate tegmina. For absolute generic identification a male example is of course necessary.

DESCRIPTION OF A NEW SPECIES OF *ODYNERUS* (*ANCISTROCERUS*) FROM THE CAPE DE VERDE ISLANDS.

By P. Cameron.

Odynerus (*Ancistrocerus*) *atlanticus*, sp. nov.

Black; almost the apical half of the clypeus, its sides above obscurely, the under side of the antennal scape, of the apex of the flagellum more obscurely, the upper basal half of the pronotum, tegulæ, the basal segment of the abdomen except a semicircular mark on the basal slope, the apical fourth of the second segment, its sides broadly at the apex, the line becoming gradually narrowed towards the base, and the legs, except the coxæ and trochanters, red. Wings hyaline, tinged with violaceous, the nervures black. ♀. Length to end of second abdominal segment, 9 mm.

St. Vincent, Cape de Verde Islands (J. J. Walker).

Basal segment of abdomen cup-shaped; its suture indistinct; the greater part of the basal two ventral segments are red. The punctuation on the first segment is fine, close, distinct; the second is finely punctured on the sides and apex; the others are more distinctly but not deeply punctured. Head closely, rugosely punctured, and thickly covered with white pubescence; the punctuation on the clypeus is wider, more scattered; it is stronger on the upper than on the lower half; the apical incision is shallow; the sides forming stout blunt teeth. The punctuation on the front runs into striations. Thorax strongly, closely punctured, and thickly covered with white pubescence; the base of pronotum transverse, the sides angled but not projecting. There are two longitudinal furrows on the apical third of the mesonotum. The upper half of the sides of the metanotum roundly project, almost forming longish rounded tubercles. The sides of the clypeus are not keeled. The first abdominal segment is larger than usual; the second is longer than its width at the apex; it is narrowed at the base, being thus clearly separated from the first. The second cubital cellule in front is as wide as the space bounded by the recurrent and

the transverse cubital nervures; both the former are received ab the same distance from the latter.

Belongs to Saussure's Section iii[e] (Vespides, i. 148), wh contains three species from Madeira and the Canaries. T present species cannot well be confounded with any of the unless it be that a large series of specimens might show t all are forms of one species, of which the present would fo a well-marked race.

AN HISTORICAL NOTE ON THE PARASITISM OF CERTAIN HOMOPTERA.

By G. W. Kirkaldy.

The parasitism of certain Homoptera of the families F goridæ and Tetigoniidæ (or "Jassidæ"), by Dryinids, t internal parasites being protected by a conspicuous exter seed-like covering lodged beneath the lobes which develop into t tegmina, was first clearly made known by J. Mik, the Austri dipterist,* although the first notice was as early as 1857, by Perris.†

In 1878, however, C. W. Dale, in his 'History of Glanvil Wootton,' (p. 304), proposed new generic and specific names, i *Homopterophagus dorsettensis*, for "a very curious black para about the size of a mustard-seed, adhering to the side of vari species of the Homoptera where the elytra join the thorax this looks like a little black bag, and Dale considers that it m belong to the Acari! I have not seen recently Dale's effusion, have extracted the above particulars from the "Arachnida" 1878, in the 'Zoological Record' for 1879 (publ. 1881), p. 23. refers, however, without doubt, to the larval covering of *Gonatop* or allied genus, though of course Dale's names have no value

By the way, I think that British students of paras Hymenoptera and Diptera would be astonished at the resu of captures and careful examination of nymphs and egg-ca of Fulgorids and Tetigoniids. *Try it!*

Honolulu.

* 'Zur Biologie von *Gonatopus pilosus*, Thoms. Ein hymenopt logisches Beitrag" (Wiener Ent. Zeit. i. pp. 215–21 (Sept., 1882), plate in which the hymenopteron is noted as parasitic on *Deltocephalus xan neurus* (= *assimilis*, Fallén.)).

† "Nouvelles excursions dans les grandes Landes" (Ann. Soc. L Lyon (2), iv. pp. 172–3), where *Athysanus maritimus* [= *Thamnotettix* stated to be parasitised by *Gonatopus pedestris*.

FOUR INTERESTING AUSTRALIAN BEES, IN THE COLLECTION OF THE BRITISH MUSEUM.

By T. D. A. Cockerell.

Gastropsis victoriæ, n. sp.

♂. Length about 15½ mm.; black, shining, and punctured; face very narrow, covered with long light yellow hair; eyes very large, converging above; ocelli very large, placed somewhat nearer to antennæ than to top of head; occipital region very little developed; antennæ ferruginous beneath, mainly black above; scape short but not very stout; first joint of flagellum slender and greatly elongated, quite as long as the next five united; last joint truncate with rounded edges, and shining beneath, the apical joints not especially swollen; anterior margin of clypeus with two shining dentiform processes, the rather wide interval between them concave; maxillary palpi six-jointed, the last three joints slender, the last linear and longer than the one before; blade of maxilla short, not as long as the palpus, with a fringe of rather long hairs at the end; labial palpi four-jointed, joints one and four of the same length, two and three equal and shorter than one, or two perhaps the shortest; paraglossæ short, broad, and rounded, subpyriform in outline; tongue short, broad, obtuse, bristly, the upper surface in the dry specimen occupied by a deep pit; malar space practically obsolete; mandibles entirely black, bidentate; mesothorax convex, with dense punctures, except on the posterior middle, where they are sparse on a shining ground; scutellum closely punctured but shining; post-scutellum large and convex; area of metathorax finely granular, triangular, with all the angles greatly produced and acute; hair of thorax yellowish white, except on hind part of mesothorax and scutellum, where it is black or fuscous; tegulæ large, rufo-piceous; wings somewhat dusky and stained with yellowish; nervures piceous, stigma obsolete; marginal cell long and narrow, slightly pointed at the end; basal nervure falling far short of transverse-medial; second submarginal cell very broad, only moderately contracted above, receiving the first r. n. before its middle; third s. m. a trifle larger than second, but not nearly so large as first, receiving the second r. n. about its middle; legs black, hairy; the anterior tibiæ, and a spot at apex of their femora, red, their tarsi also mainly ferruginous, while the outer margin of the tibiæ is blackened; middle tarsi dark red, with fuscous hair; inner face of hind tibiæ covered with a fine greyish-white tomentum; inner face of hind tarsi with reddish hair; spurs ordinary, hind margin of hind spur minutely ciliate; claws deeply bidentate; abdomen broad and convex, not at all tapering or conical, shining and punctured, hairy but not banded, nor are the hind margins of the segments pallid; the hair on first segment and basal half of second is dull white, on the others black or fuscous, except on the two last, where it is light yellow; apical plate of abdomen truncate, not bidentate.

Hab. South Australia, "70.19." (type); Victoria, "85.108." Both specimens have been in some liquid, so allowances must be

made for the description of the pubescence. The specimen from Victoria was collected by Mr. F. du Boulay. I have described this curious bee at some length, because I think it may form a new genus; but, in the absence of a more complete knowledge than we as yet possess of the mouth-parts of *Gastropsis pubescens*, it seems best to defer the proposal of a generic name. I have elsewhere (Canad. Entom. 1904, p. 304) stated that *Gastropsis* appears to be allied to *Meliturga*. *G. victoriæ* has many characters that remind one of *Meliturga*, but the elongated tongue and labial palpi of the latter are very different. However, it is known that among the Andrenids and Halictids allied forms may differ much in the length of the tongue and palpi, and I am not inclined to believe that the resemblances just mentioned are illusory. It is much to be desired that we should learn something about the habits of *Gastropsis*.

Anthoglossa aureotincta, n. sp.

♀. Length about 13 mm.; black, with the hind margins of the first four abdominal segments pale orange-golden, the first rather narrowly, the others broadly, and with overlapping white hairs, forming thin marginal bands. Head broad; facial quadrangle a little broader than long; antennæ entirely black, except that the flagellum may be called brown-black beneath; clypeus with very large punctures; anterior margin of clypeus and the convex labrum dark ferruginous; mandibles slender, not elbowed, bidentate, bright red in the middle; hair of sides of face, and cheeks, long and white; of region around antennæ, and occiput, tawny; mesothorax dull, minutely granular, its rather short hair fuscous-tipped, its plumosity so fine as to be visible only with the compound microscope; hair below tegulæ tawny, but lower down it is white; tegulæ dark brown, microscopically tessellate; area of metathorax with a dull subsericeous surface, which under the compound microscope is seen to be entirely covered with an exceedingly minute raised network; wings nearly clear, with light purple iridescence; stigma obsolete; nervures piceous; second s. m. broad, not greatly narrowed above, receiving the first r. n. about its middle; third s. m. very long, much longer than second, but not so long as first, and receiving the second r. n. near its end; marginal cell long, narrowly truncate; basal nervure falling a little short of t. m.; legs black, with copious hair, which has more or less of a golden tint, that on hind femora long and loose, conspicuously plumose; there is no knee-plate at base of hind tibia, but there is a more or less defined area, on which the hair is short and dark coppery fuscous; basal joints of middle and hind tarsi much broadened and flattened, the second joint also larger than usual, and heart-shaped; abdomen broad, with a sericeous surface; apical fimbria copious and pale chocolate-colour.

Hab. Perth, W. Australia (H. W. J. Turner). Closely allied to *A. sericea*, Smith, but differing in the colour of the flagellum, tegulæ, tibiæ, and tarsi, as well as the apical fimbria. These species are not very close to *A. plumata*, and they will

probably be removed from *Anthoglossa* at some later date. *Lamprocolletes venustus*, Sm., has golden abdominal bands like *A. aureotincta*, and is, I believe, congeneric with it; it may be separated by its smaller size and ferruginous scape, as also the colour of the legs. *Paracolletes marginatus*, Sm., seems also to be closely allied; it has the tibiæ and tarsi a lively red.

Prosopisteron, n. genus.

Small bees, similar in most respects to *Prosopis*, but with an enormous stigma, much larger than the areas of the submarginal cells combined, pointed at both ends, its apex on costal margin; body black marked with yellow (but no yellow on face), practically without hair, but margin of tubercles fringed with fine plumose pubescence, clearly visible under the compound microscope; second submarginal cell scarcely half length of first, and receiving both recurrent nervures, near its base and apex respectively; basal nervure curved, and falling a little short of transverso-medial; surface of wing with many very short black bristles; mesothorax microscopically reticulate, and with large punctures; scutellum similarly sculptured; base of metathorax microscopically reticulate, appearing dull and granular under a lens, the enclosure not distinctly defined; face fairly broad, microscopically strigulose or aciculate; anterior edge of clypeus concave; ocelli rather large, amber-colour; labrum with a truncate process; mandibles stout, simple; malar space short but distinct; antennæ quite ordinary; abdomen with a sericeous surface, the fine microscopical striæ transverse; legs quite ordinary, all the claws strongly bidentate or bifid.

Prosopisteron serotinellum, n. sp.

♀. Length about 6½ mm.; black, with the upper border of the prothorax broadly, and the tubercles, orange-yellow; abdomen slightly purplish, with a sericeous surface; antennæ long, black, the flagellum dark brownish beneath; stigma dark sepia-brown, nervures piceous or black; a dark fuscous cloud occupying nearly all of second submarginal cell and much of apical part of first; tegulæ black, shining; spurs pallid.

Hab. Queensland; "Ridg. 11. 93., 715" (Gilbert Turner). A very remarkable bee, easily known by the gigantic stigma.

Euryglossa ichneumonoides, n. sp.

♂. Length about 7 mm.; head and thorax black, legs and abdomen yellowish ferruginous; hair of head and thorax long, delicately plumose, white, except on the upper part of head and thorax, where there are some long black hairs, especially noticeable on hind part of scutellum; maxillary palpi very long and slender; antennæ very long, black, flagellum faintly brownish beneath; clypeus very shiny, with large well-separated punctures; front and mesothorax dull; tegulæ shining rufo-testaceous; wings hyaline, beautifully iridescent, the large stigma and the nervures ferruginous, the latter rather dark; second submarginal cell very large, a little longer than the first below, receiving the first r. n. a considerable distance from its base, and the

second near its apex; marginal cell pointed; basal nervure not reaching transverso-medial; femora somewhat dusky basally; abdomen with a purple lustre, and somewhat infuscated at base and apex; apical plate projecting, rounded.

Hab. W. Australia; "47. 109." At first sight one would take this for a small ichneumonid, but it is a true bee. The very large second submarginal cell is peculiar, and the species is one of several which for different reasons will be eventually removed from *Euryglossa*.

ERRATUM.—'Entomologist,' February, 1905, p. 37, line 16, for "it has gigantic ocelli, such as are not seen," read "it has *not* gigantic ocelli, such as *are* seen."

DESCRIPTION OF A NEW SPECIES OF ICHNEUMONIDÆ FROM CAPE COLONY.

By P. CAMERON.

Asphragis ? flavo-orbitalis, sp. nov.

Rufo-testaceous; the eye orbits broadly, face, clypeus, mandibles except at the apex, where they are black, the pleuræ and the apices of the abdominal segments narrowly, yellow; the flagellum of the antennæ black; wings hyaline, the stigma testaceous, the costa and nervures black. Female. Length of body and ovipositor 5 mm.

Head smooth, the face weakly punctured, almost bare. Malar space as long as the antennal scape. Thorax closely punctured, almost bare. The mesonotum and scutellum are yellow; the former has a broad brown line down the centre of the basal half and one on the sides, commencing behind the middle and extending to the apex. Metanotum transversely punctured; there is a smooth line down the centre; the apex is smooth; behind it is bordered by a keel. First abdominal segment smooth, its apex finely closely striated; the second more strongly striated; the striæ are close and extend near to the apex; the third is minutely closely punctured; the other segments are smooth. Cerci and sheaths of ovipositor black. The recurrent nervure is received at a greater distance than the length of the transverse cubital nervure from the latter; the transverse median distinctly beyond the transverse basal; the recurrent nervure is largely bullated in front. The apical nervures in the hind wings are obsolete; the transverse median is unbroken.

This agrees fairly well, generically, with the species I have described (Trans. South African Phil. Soc. xv. p. 201) as *Asphragis ? rufipes ;* but in the present species I cannot detect any pectinations on the claws. If not an *Asphragis*, there is no described genus to which it can be referred.

NOTES AND OBSERVATIONS.

Butterflies of the Pyrenees: a Correction.—In my summary of the butterflies taken last year in the Pyrenees, I mentioned that M. C. Oberthur had reported *Lycæna* var. *lycidas*, from the Lac de Gaube. My informant, M. P. Rondou, of Gèdre, has since written to tell me that the species turns out to be a new form of *L. escheri*, and not the variety of *L. zephyrus* which collectors have turned up near Berisal and in some of the lateral valleys of the Rhone, but not hitherto westward of the Central Alps.—H. Rowland-Brown; Harrow Weald, Dec. 19th, 1905.

British Butterfly Post Cards.—We have received from Mr. Walter Dannatt a series of half-a-dozen post cards upon which are printed, in colour, one or more excellent figures of British butterflies. These pictures from nature are very fine examples of what can now be done by the three-colour printing process.

Acronycta leporina var. melanocephala.—In my note in Entom. xxxviii. 289, I should have pointed out that the form of *A. leporina* met with in Lancashire and Cheshire is referable to var. *bradyporina*, Tr. In calling this the "local type" I quite overlooked the above fact. We do not get the typical *leporina*, in which the ground colour is pure white with scarcely any black dusting. The variety *melanocephala* is quite distinct, and not to be confounded with *bradyporina;* the most striking difference between them being the black thorax and darker coloration of the former.—William Mansbridge; Liverpool.

Epiblema (Phlocodes) immundana.—Referring to Mr. Bankes's note (Entom. xxxviii., p. 311), re *Epiblema immundana*, I have examined my series of the insect taken here, and find that the majority of the first brood have the dorsal blotch white or whitish. I find I have only one specimen of the August brood taken here, which I suppose indicates that it is scarce. That specimen has the blotch white.—E. F. Studd; Oxton, Exeter, Dec. 8th, 1905.

CAPTURES AND FIELD REPORTS.

Crambus fascelinellus in South Devon.—I beg to record the capture of three specimens of *Crambus fascelinellus* in South Devon. The above were identified by Mr. Bankes, and he informs me that the capture of this species in South Devon is of great interest, as it has been previously taken only on the east coast. Barrett in his Lep. Britt. Islands, vol. x., p. 108, gives its British distribution as limited to the Norfolk, Suffolk, and Essex coast. The date they were taken was August 21st, 1901. Mr. Bankes also says this is rather late for this insect.—H. M. Edelsten, F.E.S.; Forty Hill, Enfield.

SOCIETIES.

Entomological Society of London.—*November 15th*, 1905.—Mr. F. Merrifield, President, in the chair.—The decease was announced of Captain Frederick Wollaston Hutton, F.R.S., Director of the Canterbury Museum, Christchurch, New Zealand.—Mr. W. R. Dewar, Government Entomologist, Orange River Colony; Mr. William George Sheldon, of Youlgreave, South Croydon; and Mr. Francis C. Woodbridge, of Northcroft, Cornwall Road, Uxbridge, were elected Fellows of the Society.—Mr. Arrow exhibited a flower-frequenting beetle from the Transvaal, illustrating a remarkable device for the cross-fertilization of flowers, one of the front feet being tightly clasped by the curiously formed pollinia of an *Asclepias*. He remarked that he had seen no similar instance amongst Coleoptera.—Mr. W. J. Kaye showed a remarkable specimen of *Agrotis tritici*, bearing a close resemblance to *A. agathina*. It had been taken this year at Oxshott, flying over heather in company with *agathina*, and was a good example of syncryptic resemblance brought about by the common habit of resting on heather.—Mr. W. J. Lucas exhibited a specimen of *Forficula auricularia*, taken by Mr. R. A. R. Priske at Deal in September, 1905, having the left cercus normal, while the right was that of var. *forcipata*.—Dr. F. A. Dixey showed forms of South African Pierine butterflies, taken by him in Natal and Rhodesia during the dry period of the present year, together with specimens of the same species for comparison, taken in the same localities during the rains. He remarked that the exhibit illustrated the fact, now widely recognized, that these forms varied in general correspondence with the meteorological conditions prevailing at the different seasons.—Mr. Edward Harris exhibited a long series of *Hemerophila abruptaria*, bred through two seasons by him, showing the proportion of resultant melanic and light forms from combinations of the several parents, light and dark.—Mr. Selwyn Image exhibited a male specimen of *Tortrix pronubana*, taken by Mr. Harold Cooper at Eastbourne this autumn, and sent to him on October 12th. The insect, which is about the size of *T. bergmanniana*, is new to the British list, but an additional capture from the Worthing district has been reported this year.—Commander J. J. Walker communicated a paper, entitled, "Hymenoptera-Aculeata, collected in Algeria by the Rev. A. E. Eaton, M.A., and the Rev. F. D. Morice, M.A.; Part ii., Diploptera," by Edward Saunders, F.R.S., F.L.S.

December 6th.—The President in the Chair.—Dr. O. M. Reuter, of Helsingfors, Grand Duchy of Finland, was elected an Honorary Fellow of the Society.—Mr. Charles William Mally, M.Sc., Associate of the Society of Economic Entomology of Washington, U.S.A., Government Entomologist for the Eastern Province of the Cape Colony; and Mr. Harold Powell, of Rue Mireille, Hyères, France, were elected Fellows of the Society.—Dr. K. Jordan exhibited a series of varieties of the Mediterranean *Carabus morbillosus*, showing all intergradations from the ordinary *morbillosus* with broad prothorax and costate and catenulate elytra to the Moroccan *aumonti*, which has a narrow thorax and smooth elytra. It is one of the most striking cases of geographical variability.—Mr. H. St. J. Donisthorpe showed specimens of *Ptinus*

pusillus, Sturm., recently discovered in a corn factor's shop at Edmonton. The species, which is common in France and Germany, has not been recorded hitherto in Britain.—Mr. A. J. Chitty exhibited an hermaphrodite of the Proctotrupidæ, probably one of the Spilomicrinæ, Aspm.; a sand-wasp, without wings, taken by Mr. Poole, running on a beech-trunk, named by Mr. Saunders as *Didineis lunicornis;* and the male *Apion semivittatum*, Gyll. (*germari*, Walt.), taken many years ago by Mr. Walton, near the Tivoli Gardens, Margate, together with a female specimen of the same species, discovered while sweeping long grass near the Chequers Inn, Deal, on September 26th, 1904.—Mr. F. B. Jennings exhibited a male and female example of the Dipteron *Helophilus transfugus*, L., taken from thistle-heads in the marshes at Edmonton last July, and a specimen of *Stenopteryx hirundinis*, a parasite on swallows and martins, found on Box Hill, Surrey, in August.—Mr. G. T. Porritt brought for exhibition specimens of *Odontopera bidentata* ab. *nigra*, and stated that the melanic form was rapidly increasing in the Wakefield district of South Yorkshire.—Dr. F. A. Dixey showed specimens of South African Pierine butterflies, taken by him in the dry season this year, further illustrating their forms; and with them, for comparison, specimens taken by other collectors during the rains.—Mr. O. E. Janson exhibited a male and female specimen of *Ornithoptera chimæra*, Rothschild, and some remarkable species of *Delias*, collected recently by Mr. A. S. Meek in the mountain region of British New Guinea.—Commander J. J. Walker, on behalf of Mr. A. M. Lea, Government Entomologist of Tasmania, showed a specimen of a Buprestid beetle, *Cyria imperialis*, Don., having, in addition to the normal fore-leg on the left side, two supplementary fore-legs originating from separate coxæ.—Mr. G. C. Champion exhibited male and female examples of *Tetropium crawshayi*, Sharp, bred by the Rev. G. A. Crawshay from eggs deposited in July last in the bark of larches at Leighton Buzzard.—Mr. E. R. Bankes showed the unique specimen of *Depressaria emeritella*, Stn., from an unknown locality, on which the species was added to the British List many years ago; a specimen of *Cerostoma asperella*, L., discovered by Mrs. Hutchinson near Leominster, on September 21st, 1881, and only taken, as regards Britain, in Dorset (formerly), and Herefordshire very rarely; and various specimens recently acquired from the collection of the late Dr. P. B. Mason and labelled by Haworth himself, showing the method of explaining his identification of the species, described by him in his 'Lepidoptera Britannica,' published 1803–1828.—Mr. A. Bacot, who exhibited long series of *Tryphæna cornis*, bred through three generations, and brought together to test the relative proportions of melanic to non-melanic forms and the possible range of variations to be obtained from a single pair of parents, announced that the results of the second and third generations seemed to be capable of "Mendelian" explanation.—Mr. R. Shelford exhibited larvæ of *Collyris emarginatus*, Dej., from Borneo, and said that it was certainly unusual to find a predaceous larva with mouth-parts qualified to excavate burrows in wood. He also showed larvæ and pupæ of *Mormolyce*, together with a specimen of a fungus (*Polyporus*) split open to show the lenticular chamber excavated by the larva, to which access was obtained by so small an orifice that it was surprising that the

emerged beetle could squeeze through.—Professor E. B. Poulton communicated further notes by Mr. A. H. Hamm, which tended to confirm the opinion that *Pieris rapæ* chooses for prolonged rest a surface on which it will be concealed.—Mr. William John Lucas exhibited diagrams of the instars, and also of the mouth parts of the imago, to illustrate a paper read by him, "On the Emergence of *Myrmelion formicarius*"—Mr. Martin Jacoby communicated a paper entitled "Descriptions of New Species of African *Halticinæ* and *Galerucinæ*."—Mr. Claude Morley communicated a paper "On the Ichneumonidous group, *Tryphonides schizodonti*, Holmgr., with Descriptions of New Species."—H. Rowland-Brown, M.A., *Hon. Sec.*

South London Entomological and Natural History Society.—*November 23rd*, 1905.—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—Mr. F. G. Bellamy, of Eltham, was elected a member.—This meeting was devoted to a special exhibition of varieties and notable captures.—Mr. J. P. Barrett exhibited series of *Aporia cratægi* taken in 1871, in the New Forest; and in 1901–05 in East Kent; together with a variety of *Argynnis adippe* from Three Bridges, with the markings of the hind wings run into streaks and considerably suffused with black; a form of *Melanargia galatea* having the black marking almost wholly confined to the marginal and submarginal areas of all four wings; and a specimen of *Polia xanthomista* taken in 1904 in East Kent.—Mr. Tonge, photo-micrographs of the ova of all the British species of the genera *Ennomos*, *Oporabia*, *Cheimatobia*, *Anisopteryx*, *and Hybernia*, all the species of a genus being mounted on one card.—Mr. R. Adkin, a series of *Anthrocera* (*Zygæna*) *filipendulæ*, to illustrate the gradual change in the colour from the typical rich crimson through shades of terra-cotta and pinkish yellow, to a pale clear yellow; also an example in which the four basal spots were united into an irregular elongated patch. He also showed a *Pararge megæra*, in which the apical ocellated spot was absent from the right fore wing, there being only a minute black dot. It was also without the ocellus on the under side.—Mr. Hy. J. Turner, a collection of butterflies from South America, chiefly belonging to the *Ithomiinæ*.—Mr. A. Harrison and Mr. H. Main, (1) series of *Aplecta nebulosa* bred from larvæ taken in Delamere Forest. Eleven per cent were of the very dark and black forms, and a considerable number of intermediate forms were obtained. The gradation between the extremes was remarkably regular; (2) series of *Hypsipetes sordidata* from Windermere, Delamere and Seal bred, and Barmouth captured; only the first series showed any considerable variation; (3) a black variety of *Agrotis exclamationis* from Lancashire; (4) a melanic series of *Cymatophora duplaris* from Simonswood Moss, where only dark forms seem to occur now; (5) a *Melanippe fluctuata* with only the costal portion of the central band remaining, and with brownish ground colour; and (6) a specimen of *Acronycta leporina* from Delamere Forest with black thorax and abdomen, and with fore wings much suffused with black.—Mr. Stanley Edwards, a collection showing the various groups of the Heliconinæ.—Mr. West, of Greenwich, his collection of British Hemiptera, some 431 species, many of which were particularly interesting as having been taken in the near neighbourhood of

London.—Mr. F. B. Carr, a bred specimen of *Lasiocampa quercus*, in which the scales were extremely ill-developed.—Mr. Harrison, on behalf of Mr. E. Harris, of Chingford, bred series and generations of *Hemerophila abruptaria*, from ova laid in May, 1904, from the pairing of a dark female with a light male and from ova obtained by pairings of this first generation.—Dr. Chapman, bred specimens of *Arctia villica*, var. *konewkai* from Sicily, in which the spots of the fore wings run together to form fascia, together with larvæ of the same, which had black heads instead of the red of the type.—Mr. Hare, a very dark variety of *Boarmia repandata* from Basingstoke.—Mr. G. B. Browne, (1) a dark form of *Ellopia fasciaria*; (2) bred specimens of *Cabera pusaria* v. *rotundaria*; (3) an extremely dark form of *Acronycta ligustri* from Lee; (4) dark forms of *Trachea piniperda*, and (5) a varied series of *Lithostege griseata*.—Mr. Chittenden, dark forms of *Triphæna comes*, bred from Forres larvæ, and a yellow form of *Tiliacea aurago* from Ashford, Kent.—Mr. Rayward, several *Anthocera filipendulæ* with the sixth spot almost suppressed, and a most brilliant form of *Polyommatus bellargus* from Reigate.—Mr. Dobson, the species of dragonflies which he had taken last summer on the Norfolk Broads, viz. *Libellula fulva*, *L. quadrimaculata*, *Orthetrum cancellatum*, *Æschna isosceles*, *Brachytron pratense*, and *Cordulia ænea*.—Mr. Joy, a specimen of *Cupido minima*, in which the submarginal spots on the under side of the hind wings were elongated into partial rays.—Mr. South, varieties of (1) *Amphidasys betularia*, with unusually well defined transverse lines; (2) *Cleora glabraria*, a much suffused form; (3) *Boarmia cinctaria*, with the two medial lines approaching below the middle; (4) *Tephrosia punctularia*, of a pale ochreous colour; and (5) *Ematurga atomaria* aberrations from Oxshott. He also showed a series of unusually small examples of *Vanessa* (*Aglais*) *urticæ*, reared from larvæ fed on hop.—Mr. Barnett, some large Buprestid Coleoptera, with examples of the extremely large ova of the same.—Mr. Bacot, very extensive series and generations of *Triphæna comes*, originating from parents bred from larvæ collected in Aberdeenshire, and bred by Messrs. Bacot, Prout, Gardiner, Newman, Raynor, Harrison, and Hamlyn. The results were: 1st generation, ♂ melanic × ♀ red = 21 melanic, 32 red; 2nd generation, ♂ × ♀ both melanic = 212 melanic, 71 red; ♂ × ♀ both red = 285 red; 3rd generation, ♂ × ♀ both melanic = 68 melanic, 5 red; ♂ melanic × ♀ red = 17 melanic; ♂ × ♀ both red = 26 red.—Hy. J. Turner, *Hon. Rep. Sec.*

City of London Entomological Society.—*November 7th*, 1905.—Mr. E. A. Bowles, of Mydellton House, Waltham Cross, was elected a member of the Society.—Mr. A. Bacot exhibited an extensive series of *Triphæna comes*, representing three generations, the subject of an experiment in heredity. The original parents were selected from imagines bred from larvæ from Cluny, Aberdeen: in the first generation a cross between a bright red female and a melanic male produced sixty per cent. red and forty per cent. melanic specimens. In the second generation a pairing between two red imagines produced one hundred per cent. red imagines, while pairs of melanic forms produced seventy per cent. to eighty per cent. melanic, the remaining imagines being red; in the third generation broods from melanic and non-

melanic parents respectively each bred absolutely true.—Mr. C. P. Pickett, a bred series of *Angerona prunaria*, including two females bred from Monmouth, one female from Raindein, Essex, male with the usual chocolate bands a dull smoky brown and the yellow ground colour also very dull.—Mr. G. H. Heath, a male specimen of *Epunda nigra*, with the white scent glands on underside of abdomen well displayed.—Mr. H. M. Edelsten, a specimen of *Cidaria testata*, destitute of hind wings, which came to "light" in Norfolk Broads.—Mr. W. Beattie, two specimens (male and female) of *Lycæna acis* and one *H. paniscus*, which he stated were captured, either by himself or his daughter, in the neighbourhood of Mickleham, Surrey, during 1904 or 1905: unfortunately the exhibitor could give no precise data.—Mr. E. A. Cockayne, *O. dilutata* var. *christyi*, bred from larvæ beaten from elm at Rannoch.

November 21*st*.—Mr. F. Capel Hanbury and Dr. G. G. C. Hodgson were elected to membership of the Society.—Mr. E. Harris exhibited a long series of *Hemerophila abruptaria*, representing four generations. The original parents were a melanic female and a typical male, taken in North London district in May, 1905. The resulting imagines emerged in August, except two that went over to April, and yielded fifty per cent. melanic and fifty per cent. non-melanic forms. Two dark specimens paired in August, and the imagines emerged from March 24th to May 26th, 1905, about seventy per cent. being melanic and thirty per cent. non-melanic. From this brood four pairings were obtained, viz. (*a*) dark male and dark female; (*b*) light male and light female; (*c*) dark male and light female; (*d*) light male and dark female. These yielded (*a*) all melanic specimens; (*b*) all light specimens; (*c*) eighty per cent. dark, twenty per cent. light; (*d*) sixty-eight per cent. dark, thirty-two per cent. light.—Mr. C. P. Pickett an extraordinary asymmetrical male *A. prunaria*, bred in July, 1905, from Essex and Raindein Wood parents, the right wing being ab. *sordidata* and the left ab. *pickettaria*.—Rev. C. R. N. Burrows, a series of the form of *Acronycta rumicis* named by Curtis *salicis*, from Barnsley. —Mr. V. E. Shaw, a series of *E. subciliata* from Torquay, July 27th, 1905.—Rev. G. H. Raynor, ova of *Thecla pruni*.—Mr. J. Riches, several abs. of *A. grossulariata*, including a specimen with a large black blotch on right fore wing, while the left was normal.—Rev. G. H. Raynor read a short paper, entitled 'A New Index Entomologicus,' in which he pointed out the inconvenience, for reference purposes, of the annual diary kept by most entomologists, and detailed his own system of using one large volume, in which a page was reserved for each species; on this page entries of captures could be made year after year, together with notes on life-history, &c., and references to records, &c., in various entomological publications.—S. T. Bell, *Hon. Sec.*

Entomological Club.—A meeting was held on December 15th, 1905, at 27, Hereford Square, S.W., the residence of Mr. Arthur J. Chitty, the host and chairman of the evening. The other members present were Prof. Poulton, and Messrs. Adkin, Donisthorpe, and Hall. There were ten visitors. Before supper an hour or two was given to the inspection of the host's entomological collections, and especially the fine one of British Coleoptera.

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DESCRIPTION OF ANOTHER NEW SPECIES OF ÆSERNIA (COLEOPT. CHRYSOMELINÆ) FROM NEW GUINEA.

BY MARTIN JACOBY.

SINCE the publication of the descriptions of several new species of *Æsernia* (*ante*, p. 1), I have received several specimens of another handsome species, of which I here give the description.

Æsernia gestroi, sp. n.

Obscure blackish-green; the sides of the thorax strongly rugose, with a single fovea near the base; elytra foveolate punctate-striate anteriorly, the interstices longitudinally costate, with a broad fulvous transverse band below the middle, the apex closely and finely punctured. Length, 17–20 mm.

Head impunctate, deeply depressed between eyes, antennæ bluish-black, slender; thorax twice as broad as long, the sides nearly straight, very slightly narrowed at the base, the anterior margin concave, the angles pointed, the disc with a narrow central longitudinal groove, the sides irregularly and deeply foveolate-rugose, with a single larger fovea in front of the other rugosities; elytra with the greatest elevation near the base, each with about ten highly raised costæ, these are followed by a broad dark fulvous transverse band; the interstices between the costæ impressed with deep irregular punctures, often confluent and forming elongate foveæ, the fulvous band is narrowed to a slight degree near the suture and impressed with a few punctures, but the apical portion is closely and more strongly punctured. Body beneath and legs bluish-black.

Hab. Babooni, British New Guinea.

More nearly allied to *Æ. formosa*, Gestro, than any other species, but of a more dull greenish colour, the elytral interstices much more deeply and confluently foveolate-punctate. Dr. Gestro says nothing of any elytral costæ, so prominently marked in the present species, and describes his insect as having simply, strongly, striate-punctate elytra. I cannot therefore

identify *Æ. gestroi* with *Æ. formosa*. In *Æ. corallipes*, Gestro, the last segment of the abdomen is described as testaceous. In the insect here described the entire abdomen is bluish-black, and the fulvous elytral band is much wider than in *Æ. formosa*; the legs also are greenish-black.

DESCRIPTIONS OF TWO NEW SPECIES OF BRACONIDÆ FROM AUSTRALIA.

By P. Cameron.

Bracon turneri, sp. nov.

Black, the pro- and mesothorax, except the former at the base below, red; the mandibles, except their teeth and the sides of the first abdominal segment, pale yellow; apical joints of palpi fuscous; wings fuscous, the nervures and stigma black. ♂. Length, 5 mm.

Central part of first abdominal segment coarsely, irregularly punctured; a narrow, fine, shining keel down its centre; the second segment is deeply, irregularly, rugosely punctured, except at the apex in the middle, where there is a raised, smooth, shining area to which the middle keel extends; the latter is smooth and shining, the dilated base is longer by about one-half than its width at the base; suturiform articulation deep, crenulated; it does not extend to the sides and there is no apical lateral branch; the third and following segments are smooth and shining, sparsely covered with longish white pubescence; the hind tibiæ and tarsi are thickly covered with long, soft, white pubescence; the second abscissa of the radius is as long as the third; head and thorax smooth, thickly covered with long, soft, white hair.

Agathis latibalteata, sp. nov.

Black, shining; the sides of the first and third abdominal segments, the apex of the first broadly, and the whole of the second, and the greater part of the ventral surface, pale yellow; the apical two-thirds of the fore femora and their tibiæ and tarsi, pale testaceous; wings fuscous, highly iridescent, the nervures and stigma black. ♂. Length, 6 mm.

Head, pro- and mesothorax smooth, shining; the face, pleuræ and breast sparsely covered with white pubescence; mandibles of a paler rufous colour than the head; the palpi pale testaceous; scutellar depression with a stout central and two lateral narrower keels, the outer obliquely sloped; mesopleural furrow weakly crenulated; metanotum rugosely punctured, the sides more weakly than the centre; there is no area, but the centre is raised, the raised part narrowed above; the sides and pleuræ are densely covered with long white pubescence; abdomen smooth, shining; the first segment is fully more than twice longer than the width at the apex; areolet small, oblique, triangular; the nervures united above, where they are much thickened; radial cellule short, narrow; front deeply excavated laterally; the metapleuræ are more thickly pubescent than usual, as in some species of *Euagathis*.

NOTES ON AFRICAN COTTON INSECTS.

By Fred. V. Theobald, M.A.

In these days of development of cotton cultivation in Africa much interest has been centred on the work of cotton insects. It has been justly thought that, with the importation of seed from one part of Africa to another, and from America and the West Indies, &c., to Africa, we should be introducing numbers of strange cotton insects.

Undoubtedly the worst cotton pests in America and the West Indies are the cotton boll weevil (*Anthonomus grandis*, Boh.), the cotton boll worm (*Heliothis obsoleta*, Fabricius), and the cotton worm (*Aletia argillacea*, Hübner).†

In recently going over the cotton pests of the world, I have come to the conclusion that very few insects are likely to be imported in seed to Africa; the most important are the cotton boll weevil, and a small Tineid moth (*Ereunetis minuscula*, Walsingham), the larvæ of which have been noticed boring into cotton-seed in the West Indies. A sharp look-out should undoubtedly be kept for both pests amongst the seed, especially for the weevil, for it may sometimes be found hybernating amongst the seed in numbers.

Before very long we are sure to hear of the cotton boll worm of America (*Heliothis obsoleta*) attacking cotton in West and Central Africa. The conclusion might possibly be formed that it had been imported.

This widely distributed moth is known in Africa already as a true native species. It has been found in the Sudan, in Abyssinia, in British East Africa, in North Gamiland; it occurs all over Cape Colony, the Orange River Colony, the Transvaal, in Natal and Basutoland. It attacks mealies and other native corns. I rather fancy from the description sent me that it has already started attacking cotton in Mozambique.

At present all the cotton pests known in Africa are confined as cotton pests to that continent, except the omnivorous cutworm (*Agrotis ypsilon*, Rott.), known in America as the greasy cutworm.

The best known are those found in Egypt, namely, the cotton boll worm (*Earias insulana*, Boisduval), which also occurs in Sokotra at 3500 feet.

The Egyptian cotton worm (*Prodenia littoralis*, Boisduval), which attacks the leaves, and concerning which the Khedivial Government has recently issued instructions to be enforced for its eradication.

The small cotton worm (*Caradrina exigua*) recently worked

* Read before the Association of Economic Biologists, at Liverpool Dec. 29th, 1905.

† The cotton boll worm of America has always been known as *Heliothis armiger*, Hübner (1796), but it is now known to be the *Bombyx obsoleta* of Fabricius (Ent. Syst. 3, i. p. 456, 1793).

out by Mr. Willcocks, also attacks cotton-plants; an insect well known in America, Europe, and our own country.

The caterpillar of *Agrotis ypsilon*, has likewise been found destructive to cotton by Mr. Willcocks in Egypt. It is also harmful in America. This practically completes the previously known lepidopterous pests.

The only others worthy of note are, first, the Egyptian cotton-stainer (*Oxycarenus hyalinipennis*, Costa), found on many other plants, particularly around the Mediterranean. This "stainer" does not always seem to do much harm, but they may get in the ripe bolls, and they suck the sap from blossoms and the base of the young bolls, and so stop development. They also pollute the cotton, making it dirty, and give it a disagreeable smell.

So far I have only received one species of cotton aphis from Africa. This seems to be *A. malvæ*, Koch, which is very annoying in Egypt, and more so in the Sudan; it also occurs on melons.

A report on these Egyptian pests is being prepared by Mr. Willcocks at Cairo, so that no further reference is needed here.

New Pests.

The Cotton Gold-tail (Porthesia virguncula, *Walker*). — The only new moth is one of the gold-tails, the *Porthesia virguncula* of Walker. These moths and their pupæ were sent me by the Director of Agriculture of the British East Africa and Uganda Protectorate, and were briefly recorded in my Report on Economic Zoology for 1904–1905, p. 117.

This moth is very widely distributed, and is very common in India. I do not think it has, however, been previously recorded from Africa. It is of a pure satiny white, with a small golden tail-tuft. The specimens received from East Africa measured from three-fourths to a little less than an inch across the expanded wings. They are evidently subject to great variation in size, for in the large series in the British Museum, from India, some measure nearly an inch and a half across. The larvæ very much resemble those of our brown-tail (*Porthesia chrysorrhœa*). They spin a delicate cocoon of dull white, rather loose silk and hairs. From the note sent me they apparently live freely on the leaves as our *P. auriflua* does, and not gregariously, as does the brown-tail (*P. chrysorrhœa*). The pupa is bright chestnut-brown. The larvæ feed ravenously on the leaves, leaving only the midrib, and were found severely damaging the foliage in the Uganda Protectorate, at Malindi, in October. They could easily be kept in check by spraying with Paris-green, or, better still, arsenate of lead wash. It is extremely unlikely that it has been introduced, and will probably be found elsewhere in Africa on the cotton and other plants.

A Flea-beetle Enemy.—From the Sudan Dr. Balfour has recently sent me some small brown Halticid beetles, which are

found to do considerable harm to the cotton there. They are small and very obscure beetles, which Jacoby has identified as his *Nisotra uniformis* described from Sierra Leone.

New Cotton-stainers.—Three cotton-stainers that have not previously been found on cotton have come from Uganda, one being a new species recently described by Mr. Distant. These insects, especially those of the genus *Oxycarenus*, are often to be found abundantly in cotton bales. Opinions differ as to the amount of damage they do. All agree that they spoil cotton by being squashed in the gin and thus staining the fibre. They also puncture the bolls and cause them to become hard so they cannot open, and thus the cotton becomes matted and spoiled, and in addition they stain the cotton with excreta when sucking the seed.

Oxycarenus albidipennis, Stal.—This bug is closely related to the Egyptian cotton-stainer. It lives in the cotton boll after opening, and attacks the cotton-seed. The larval stage is flesh- or pink-coloured, with dusky head. The specimens were found at Malindi, in Uganda, in February, and were sent me by the Director of Agriculture, who reports that it causes discoloration of the cotton.

Oxycarenus exitiosus, Distant.—This small Lygæid was sent me by Mr. Linton, who found them in numbers in cotton bales at Nairobi. It proved to be a new species, and was described by Mr. Distant ('Entomologist,' July, 1900, p. 169, vol. xxxviii. No. 506). It is a black species, with posterior lobe of the pronotum and corium testaceous, a dark spot at the posterior angle of the latter; the membrane pale hyaline grey; the lateral margins of the corium often distinctly lutescent; abdomen sanguineous beneath except the apex, and a central longitudinal line. Coxæ, a central ring to the intermediate tibiæ, and the posterior tibia, except base and apex, yellowish. Length 3 to 4 millim.

This insect has also been found in Cape Colony. Mr. Distant was informed it was there injurious to peaches. The habitat added by Distant is Cape Town, Seapoint, South Africa (Mansell Weale). It probably works in the same way as the related Egyptian species.

Dysdercus nigrofasciatus, Stal.—This bug is present in large numbers in all cotton-fields in Uganda, and has occurred in bales of cotton also. It is one of the largest bugs found on the cotton in Africa so far. It probably occurs on a number of other plants, and may be found in many parts of Africa. It is about 12 mm. long. Head chocolate-brown; antennæ dark brown. The narrow anterior lobe of the pronotum rather pale grey, mid lobe bright brown, the large posterior lobe pale yellowish brown, almost ochreous. Corium pale ochreous, with a broad black transverse bar on the posterior half; membrane black; under wings dusky brown; legs deep reddish brown. Abdomen reddish above; the first, second, and third segments

below pale creamy yellow with median basal dark areas, fourth and fifth dark brown, sixth pale creamy, apex dark brown. It also occurs in Europe. It gives the fibre a dull yellowish discoloration.

There will probably be found a host of native insects attacking cotton as its area of cultivation increases. These will come from wild plants near by. It is thus very important in the cultivation of cotton to keep the land and borders of the plantations as free as possible from all weeds and native growth.

DESCRIPTION OF A NEW SPECIES OF *GABUNIA* (ICHNEUMONIDÆ) FROM NATAL.

By P. Cameron.

The genus *Gabunia* was described by Kriechbaumer in Sitzber. Naturf. Ges. Leipzig, 1895, p. 130, three new species—namely, *ruficoxis*, *cærulea*, and *flavitarsis*—being referred to it. In the Mém. Soc. Ent. Belg. v. 1896, Tosquinet described a new genus, *Nadia*, with three new species, namely, *fasciipennis*, *cyanea*, and *formosa* (pp. 337–344), all (like the species of *Gabunia*) from West Tropical Africa. In his "Classification of the Ichneumon Flies," Bull. U.S. Nat. Mus. xxiii., Ashmead places *Nadia* in the *Lissonotini*, and *Gabunia* in the *Xoridini*, in which tribe *Nadia* is placed, quite correctly, by Tosquinet. In the Zeit. f. Hymen. ü. Dipter. 1904, p. 172, Prof. R. Krieger, from an examination of Kriechbaumer's types, concludes that *Nadia* is a synonym of *Gabunia*, the three species of the two authors being stated to be very closely allied, and might be even identical. I am now in a position to add a new species from the East Coast (Natal), most nearly allied to *G. cyanea*, Tosq., and *G. cærulea*, Kriech., if these two be really distinct.

Gabunia ruficeps, sp. nov.

Dark blue; the head red, except for a dark blue stripe behind the ocelli, touching the eyes and the apical two-thirds of the mandibles. Antennal scape red; joints eight to twelve white. The tibiæ and the tarsi almost want the blue tint, which is conspicuous on the coxæ, trochanters, and femora; the apex of the first joint of the hind tarsi and the second, third, and fourth are yellowish white. Wings purple, highly iridescent; on the anterior a wide clear hyaline cloud commences at the base of the stigma, and extends clearly beyond the areolet; there is a smaller cloud at the apex of the hind wings, the edge itself being clouded; the nervures and stigma are black. ♀. Length, 22 mm.; terebra, 8 mm.

Centre of face irregularly striated, the striæ converging towards the centre; the sides transversely reticulated, more strongly above

VARIATION IN MELITÆA AURINIA.

th n below. Vertex smooth, sparsely punctured; the front below the o ali is raised, the raised part gradually narrowed below, and stoutly, transversely striated. Temples smooth and shining; the malar space bears a narrow furrow near the middle. Clypeus above clearly separated, but not by a distinct furrow; its upper part stoutly, irregularly punctured; the obliquely depressed apex is almost smooth; its apex is black, transverse, and has a tubercle in the centre. Palpi black. Mesonotum strongly, closely punctured; the depressed apex in the middle strongly, closely striated, the striæ oblique and converging from the sides towards the middle. Apical half of scutellum more strongly and closely punctured than the basal. Post-scutellum strongly but not closely punctured. Metanotum strongly, closely, transversely striated; the striæ on the sides oblique, in the middle more or less roundly curved. Pleuræ closely, strongly, obliquely striated, the striæ more or less curved; the centre of the propleuræ smooth, shining. Abdomen smooth and shining. Areolet four-angled, narrowed in front; the recurrent nervure uniting in the middle; the transverse median nervure is received very shortly behind the transverse basal. Transverse median nervure in hind wings broken in the middle. Hind tarsi stout, closely spinose below; the spines longer at the apices of the joints; they are stouter on the fourth joint.

Noteworthy of this species is its great resemblance to *Cryptaulax ruficeps*, Cam., and *Oneilella formosa*, Bé., all three having the same general coloration of body and wings.

VARIATION IN *MELITÆA AURINIA*.

By V. P. Kitchin, F.E.S.

(Plate I.)

These notes and the figures illustrating them refer to specimens of *M. aurinia* taken and bred by the writer in Co. Galway, Ireland.

The typical Irish form of the insect known, I believe, as var. *hibernica*, has clear yellow markings, free from that brownish suffusion which detracts from the brilliancy of our English specimens. For the typical Irish form see fig. 12.

Variations of the upper wing.—Figure 1 shows ab. *virgata*, in which the black band dividing the yellow patch near the middle of the costa is lacking. The opposite extreme is reached in fig. 2, a heavily black-banded form. In fig. 3 is seen a variety closely approaching that named *merope*, which is found in the Alps. In this the black band crossing the yellow patch on the inner margin is missing, all but a mere spot. Figure 4 is that of a dwarfish variety with narrow fore-wings. In fig. 5 is shown a variety in which the structure of the wings is abnormal. Two nervures (5 and 6) on upper wing, and one on lower wing, are

entirely lacking, and are not even marked by the usual black lines. Half of nervure six is missing in fig. 10.

Variations of the lower wing.—The central spot and lower spot in the yellow band are absent in fig. 6. The same specimen shows also the row of crescents round the hind margin greatly reduced in size, and brownish yellow instead of clear whitish yellow. Figure 7 shows a variation often present in ab. *virgata.* The central yellow fascia is continued almost to the base of the wing by an irregular oblong patch. A similar extension of the corresponding band on the under side is not infrequently found on the same specimens. It occurs also when the upper side does not correspond (see fig. 9).

Variations of the under side.—Black bands are sometimes found near the inner margin and costa, corresponding to those on the upper side. The pale yellow fascia on the under wing is often powdered with black scales. In fig. 8 it lacks the outer black line. This variety illustrates a tendency common to many continental members of this genus, in which the black markings are restricted to the basal portion of the under wing.

Variation of the antennæ.—I have a specimen (not figured) in which the antennæ are noticeably shorter than usual.

Pathological aberrations.—In fig. 2 the costa is straight on one side and curved on the other. Figure 10 is that of a specimen which I watched emerging from the pupa. The wings lack scales over most of their area, but the fringes are all perfect.

ENTOMOLOGICAL NOTES FROM SWITZERLAND.

By Gerard H. Gurney.

The following short notes on my captures in Switzerland last summer were roughly jotted down in my note-book every day, and may, perhaps, be of interest to others who were also able to spend a few weeks in that wonderful country. During an all too short six weeks, spent mostly in, and near, the Rhone Valley, I identified one hundred and twelve species of butterflies, irrespective of the moths, which, out of a possible one hundred and eighty-eight, is a large percentage.

I arrived at Aigle, at the entrance, or beginning rather, of the Rhone Valley, on Saturday, June 24th, and stayed at the Grand Hotel, about a mile from the town, at the side of the valley of the "Grand Eau," which proved to be a capital collecting ground.

The weather for a week previous to our arrival had been fine and hot, but the *very* day I got there it clouded over, and the next two days were wet and dull—rather a damper to one's enthusiasm on first getting out. However, Tuesday the 27th broke fine and

cloudless, and for the remainder of the time the weather was, as a rule, glorious—in fact, the occasional dull days we had came almost as a relief, and enabled me to get set some of the many butterflies in my boxes, the result of two or three days' collecting, perhaps.

In the hayfields and meadows surrounding the hotel at Aigle the following species were in abundance :—

Aporia cratægi, *Colias hyale* (a good deal worn), *Nomiades semiargus*, *Argynnis adippe*, *Melitæa athalia*, *M. parthenie*, *M. dictynna*, and *Aphantopus hyperanthus*.

A little less plentiful, though still very common, were *Argynnis aglaia*, *A. niobe*, almost all of the var. *eris*—*Limenitis camilla*, *Pararage mæra*, and *P. achine*—the last in splendidly fresh condition. A walk up the mountain at the back of the hotel in the direction of Ollon produced *Papilio podalirius*, and *P. machaon*, and four or five *Lycæna arion*, *Dryas paphia*, *Melitæa phœbe*, *Satyrus alcyone*, and a single specimen of *Carcharodus lavateræ*, besides hosts of commoner things.

Another day took me down to the Rhone Valley, where the hay was being cut. None the less I turned up several things of interest: by the side of the river, *Brenthis dia* was fairly common and a few worn *B. euphrosyne*, some fine large specimens of *Cupido minima*, and a couple of male *Rusticus argyrognomon* Brgstr. The same day I came upon a row of four small sallow bushes which had been almost completely denuded of their leaves by a vast colony of the larvæ of *Euvanessa antiopa*; they looked very conspicuous on the bare boughs as they were quite full grown, and those I took proceeded to pupate the very same evening, emerging satisfactorily three weeks later. I also found a "nest" of the larvæ of *Eugonia polychloros* on willow, about a mile further on. Along the road between Aigle and Sepey on June 29th *Parnassius apollo* was appearing, evidently quite freshly emerged; in the same place *Melitæa didyma*, all males, and very highly-coloured, was common, with *S. alcyone*, *Thecla ilicis*, var. *cerri*, and a bit further on, and about three miles from Sepey in the hayfields, I got a few fresh *Chrysophanus hippothoë*, and some *Cœnonympha iphis*, besides a good many commoner "blues" and "skippers."

Four days later, on the same ground, three very fresh *Apatura iris* were taken, *P. apollo* was plentiful, and a single very large male *Satyrus cordula*.

On July 4th I moved my quarters to Villars, a small village above Bex, about 4200 ft. up and in full view of the wonderful Argentine and Diablerets mountains. Besides being a good locality itself, Villars has the advantage of being on a funicular railway, so that one could very easily make excursions down or in the other direction. In the fields round the village I took nice series of *C. hippothoë*, *Polyommatus eumedon*, and *C. iphis*; a

little higher up, *Brenthis amathusia*, *Erebia melampus*, and *E. ligea* were very abundant, while at about 5000 ft. I found plenty of *E. stygne* and *E. œme*. Three fresh specimens of that gaudy little "copper" *Chrysophanus amphidamas*, all males, were also taken near a small wood not far from Villars. Further down, in the direction of Gryon, on the wooded sloping hillside, all the butterflies of the neighbourhood seem to be collected together; four or five different species of "blues," the commonest being *P. damon*, great numbers of *M. didyma*, the males extremely richly coloured, *L. camilla* and *sibylla*. *S. cordula*, males and females, both in fine condition, besides many others of commoner sorts. A long expedition to Solalex, at the foot of the Argentines, on July 14th, resulted in *Colias phicomone*, eight beautiful fresh specimens of *Lycæna alcon*, several *Erebia manto*, a solitary specimen of *Brenthis pales*, besides *Polyommatus hylas*, *Erebia æthiops*, and *E. stygne*. Before leaving Villars two more *C. amphidamas* were taken very close to the place where the previous pair had been captured, and no doubt they were all of the same brood; I also took two or three fresh *C. dorilis*, and *Brenthis ino* was beginning to come out in the fields behind the hotel the last two days of my stay, and probably would soon have become plentiful there.

On the 17th I went to the Riffel Alp, above Zermatt, a glorious spot, not merely from an entomological point of view. For, with one of the grandest views in Switzerland always before one, the wonderful Matterhorn peak for ever rising higher, the top either lost in clouds or outlined against the blueness of the atmosphere, he must indeed be a prosaic man who could be unconscious of his surroundings for a minute; and the butterflies were as captivating as the place. I seemed to have arrived at the Riffel at exactly the right time, as, although one or two of the higher alpine species were distinctly *passé*, most of the insects were in very good condition. To mention all the butterflies I got during the fortnight I was there is impossible. I can only casually note the most interesting of them.

A nice series of *Anthocharis simplonia* was taken about a mile above the Riffel Alp, where they were very local, flying swiftly up and down a rocky moraine. A female, which was kept alive for ova, unfortunately was exposed one morning to the hot sun and was dried up. A little below the hotel, in the direction of Zermatt, *Polyommatus orbitulus* was fairly plentiful, and a little lower still was a small colony of *P. donzelii*, with two or three specimens of *P. baton* flying with them.

P. eros, all males, were taken flying over puddles on the path. *Melitæa parthenie* var. *varia* was plentiful but over, but *B. amathusia* was very fresh and finely coloured; I was surprised to find it as high up as this. *Cœnonympha satyrion* was common, and the two "coppers"—*Chrysophanus virgaureæ* and *C. hippothoë* var. *eurybia*

—were both abundant in the luxuriant meadows below the hotel; two or three *Chrysophanus alciphron* var. *gordius* were netted nearer to the village of Zermatt, one being a very small, dwarfed specimen. Amongst the "Erebias" *Erebia mnestra*, *E. euryale*, *E. goante*, and *E. ligea* were all fairly common at rather a lower elevation than the Riffel Alp itself; whilst further on, as soon as one left the flowery meadows and got higher on the moraine, *Polyommatus optilete*, *Pieris napi* var. *bryoniæ*, *Colias palæno*, *Melitæa aurinia* var. *merope*, *Erebia lappona*, and *E. tyndarus* all occurred, becoming commoner the higher one got, and at the Gorner Grat, over 10,000 ft. high, *Pontia callidice*, *Erebia alecto* var. *glacialis*, and *E. gorge* were all fairly plentiful, though very local, One day, about a week before I left the Riffel Alp, I made a long expedition below Zermatt, down the Visp Valley, in the direction of Stalden, getting out at the little station of Kalpetran, some seven or eight miles from Zermatt; and the rough, sloping ground here on either side of the road proved to be a capital collecting ground. It was an exceedingly hot day, and there were great quantities of insects everywhere, the air being filled with the "summer hum" of countless bees, grasshoppers, and crickets. *P. apollo* was all over the place, a female flew down and laid an egg on a plant of saxifrage at my very feet; I kept her alive hoping she would lay some more, but although she lived a week and became quite tame, nothing came of it. However, another female from the same locality laid a quantity of fertile eggs which successfully hatched in due course. *M. phœbe*, and *M. didyma*, both in beautiful condition, were very abundant, and a few very fresh *A. lathonia* were noticed; a little further on *S. cordula*, males and females, were in great numbers and flying in the same place; a good many *Epinephele lycaon* and some fine large *Hipparchia semele*, though all typical, none of the variety *aristæus*. Here also I found a nice colony of that beautiful "Burnet" *Syntomis phegea*, which I had not taken before. Amongst a crowd of common "blues" were two fresh *L. alcon*, and off a tall thistle by the side of the path a splendid male specimen of *Rusticus* var. *lycidas* in grand condition.

Two or three *C. alciphron* var. *gordius* were netted, rather worn however, and a couple of *Pyrgus sao*, besides *C. lavateræ*, and several commoner Hesperiids. *C. phlœas* var. *eleus* was flying near some moist patches in company with *C. virgaureæ* and one immense *P. podalirius* near Stalden; a few *Polygonia c-album*, some very brightly coloured *T. ilicis* var. *cerri*, and some fresh *A. niobe*—in fact, it was a memorable day for insects all round.

In the above notes I have simply mentioned a few of the most interesting butterflies taken, and have not touched on the moths, of which a number of good things were captured almost entirely at light. My two great "coups" were a fine specimen

of *Hoplitis milhauseri*, caught at one of the acetylene lamps outside the hotel at Aigle, and a beautiful fresh *Plusia v-argenteum* which flew into my bedroom at the Riffel Alp attracted by the electric light. Of larvæ found the most interesting was a nearly full-fed larva of *Parnassius mnemosyne*, which was walking across the road close to Bex Station; it fed up slowly on a species of monkshood, and is now a seemingly healthy pupa.

THE DRAGONFLIES OF EPPING FOREST IN 1905.

By F. W. and H. Campion.

On May 7th we started up from the rushes a single immature Agrionid, which unfortunately escaped us. Cloud and rain subsequently coinciding with our opportunities for collecting prevented the resumption of work until May 28th, when we found that *Agrion puella* and *Ischnura elegans* had already appeared, as well as *Pyrrhosoma nymphula*, which with us always precedes in point of time the two mentioned species.

The only addition made during the season to our local list of Odonata was the orange variety of *Ischnura elegans*, which we shall have occasion to mention again.

The various species taken were as follows:—

(1) *Pyrrhosoma nymphula*, which was very abundant and flying in pairs on May 28th, was not taken later than July 2nd.

(2) *Agrion puella* was scarce on May 28th, but common and *in cop.* on June 4th; thereafter it was collected regularly until July 30th.

(3) *Ischnura elegans*.—Although the species was represented on May 28th by var. *rufescens*, we did not take the typical form before June 4th, when it was common. On August 13th, after several weeks during which none but mature individuals were obtained, we suddenly found a considerable number of immature specimens. The last examples of the species were taken on September 3rd.

Var. *rufescens*.—As already stated, this variety was met with for the first time in Epping Forest. This fact is somewhat remarkable, as one at least of the ponds at which it has now occurred has been regularly examined for Odonata during several years past, without a trace of it having been found. One specimen was taken on May 28th, one on June 13th, and two on July 16th; one of those taken on July 16th escaped from the net.

Var. *infuscans* has again occurred, and some further observations upon the variety have been published (Entom. xxxviii. 298).

(4) *Anax imperator* was seen on a few occasions, but only one specimen was obtained. That was a male, which we found on

June 4th in a much damaged and nearly dead state on the banks of a pond which the species usually frequents. The left hind wing was in a shrivelled condition, and the insect's presumably imperfect powers of flight may have led to its destruction.

(5) *Libellula depressa* was first seen and taken on June 18th, and afterwards became pretty plentiful; it was not noticed later than July 22nd.

(6) *Enallagma cyathigerum.*—It is curious to note how far from water this species, and especially the females, will sometimes travel. We have already recorded (Entom. xxxvi. 49) the occurrence in 1902 of a female in our garden at Walthamstow, which is fully half-a-mile distant from any sheet of water. The first capture of the past season was a solitary female found in the Forest on June 25th quite a long way from water, and another female was taken at rest in our garden at about 5.30 p.m. on July 2nd. A male was taken at rest in one of the rooms in our house on July 23rd, but no specimens were taken anywhere after September 3rd.

(7) *Sympetrum striolatum.*—A single immature specimen was seen and netted on July 16th; it had just emerged from the water, and we found its empty nymph-case clasping a neighbouring rush. Two weeks later the species was still immature. The last specimens occurred on September 18th.

(8) *Æschna grandis.*—The earliest specimen seen was a male taken on July 16th. On the 22nd of that month we took a female which was ovipositing in a pond, and found that more than half the length of its abdomen—that is, part of segment five and the whole of segments six to ten—had been thrust below the surface of the water. The species was collected pretty frequently until September 3rd.

(9) *Æschna cyanea.*—The first representative of this species was seen on July 30th. It appeared to be flying in a perfectly normal manner, but, upon being taken, it proved to be a teratological male. Both the wings on the right side looked as though the tips had been scorched by fire, and the hind wing was considerably shorter and broader than the corresponding wing on the other side. Pterostigmata were absent from both wings. The right hind leg was also malformed, the tarsus being represented apparently by a single short joint divided at the extremity. Another male, taken on September 18th (the latest date for this species), had the left hind leg in a still more rudimentary state, the tibia being abnormal as well as the tarsus.

Not a trace of *Æschna mixta* was met with, notwithstanding the strictest search made at the proper season and in its favourite haunts. Another and more remarkable omission from the year's dragonfly list for this locality was the total absence from the ponds which we habitually visit of the usually common little insect, *Lestes sponsa.*

LEPIDOPTERA AT RANNOCH IN 1905.

By E. A. Cockayne, F.E.S.

On May 17th we arrived at Rannoch, a party of three. The weather being beautifully fine, we decided to go at once in search of *Anarta cordigera* and *Fidonia carbonaria*.

After a rather warm climb through the birch-woods and the heathery moor above, we reached the bare and rocky top of the hill, where the bearberry grows hanging over the rocks in long trailing masses.

We soon saw a single *A. cordigera*, flying very fast, and though we saw many more during the day, only captured three. *F. carbonaria* we scarcely saw till nearly twelve o'clock, when they began to appear on all sides, flying fairly actively, and, if frightened, they were impossible to catch on the slippery and uneven ground. The larva of this insect is said to feed on birch and sallow, but I noticed that it was only met with where bearberry was growing in abundance, and the females frequently settled on this plant. There is plenty of birch and sallow on this hill, but none on the part where the insect occurs. Probably, like *A. cordigera*, it is exclusively a bearberry-feeder. *F. carbonaria* was easily distinguished from *F. atomaria* by its greater powers of flight, its smaller size, and bluer appearance. The latter, too, was much commoner at a slightly lower level. The next few days the weather continued fine, and *A. cordigera* was seen in considerable numbers in those isolated places where the bearberry was sufficiently common. They appeared to spend most of the day feeding on the flowers of this plant, or resting on the ground. On one occasion, early in the afternoon, we saw fifteen hovering together at the side of a large stone, as if assembling. Several were caught, but no female could be found, and I do not think there was one. They do not pair till dusk, when they settle down for the night on the patches of bare peat or on the rocks, always in a place sheltered from the wind, and never many yards from a bearberry plant. Perhaps it was more or less parallel to the instance, mentioned by Barrett in his 'British Lepidoptera,' of an assemblage of *Anarta myrtilli* which was undoubtedly attracted by a dead and dried-up moth, too bleached to be identified. *F. carbonaria* flies chiefly from twelve noon onwards, and is very susceptible to cold. One bright and sunny, but very cold day, we did not see any fly naturally, and could only put up two or three.

We were surprised to find several *Thecla rubi* on the blossoms of the bearberry, and later saw them in abundance in the Black Wood, settling on the clumps of whortleberry (*Vaccinium vitis-idæa*). At the time I wondered what the larvæ had fed on, but find, on looking up the subject, that both these plants have been recorded as food-plants of this butterfly.

Anarta melanopa, chiefly males, began to appear on May 18th, the bearberry, however, which furnishes food for both larva and imago, did not come into flower at this elevation till May 28th, and was then eagerly visited by both sexes. Bearberry (*Arctostaphylos uva-ursi*) in the Rannoch district grows at two levels, luxuriantly at 800 to 900 feet, and, separated by a zone where it is absent, again at 2000 feet as a stunted closely-growing plant. At the lower level *F. carbonaria* and *A. cordigera* occur and, at the upper, *A. melanopa*. They rarely encroach on one another's ground. I should have said never, but we did take a couple of *A. cordigera* on the *melanopa* ground.

During the whole of May we found odd specimens of *Hadena glauca* on the rocks, and one occasion saw one flying in the sunshine. On June 1st, however, we were astonished to see a good many eagerly feeding at the bearberry with *A. melanopa*, in the hot midday sun.

In spite of careful searching, we never saw *melanopa* settled on a rock, though these matched its colour perfectly. On the crisp grey lichen, which carpets the whole summit of the mountain, I found two at rest, and from it many more were disturbed.

We saw one of these active little moths captured by a small brown crab-spider (*Thomisus ? cristatus*). As I was standing, net in hand, waiting for the moths to visit the flowers, one came and, before I could move, the spider sprung and seized it just behind the head, and, though many times smaller than its prey, held it until it was dead. It did not even let go when I placed both on my hand. We also noticed a good many large grey hunting-spiders running over the lichen, probably in search of a similar meal.

Lower down the hills we came across a few *Acronycta myricæ* on the rocks. From the number of freshly emptied pupa-cases, and the few moths found, I think they must choose other resting-places. Probably they sit on the bare peat, as we found *A. menyanthidis* and *Scodiona belgiaria* later. *Glauca* and *menyanthidis* were also noticed three or four times, high up the trunks of birches and aspens. Two or three *Arctia fuliginosa* var. *borealis* were seen flying, and looked very bright as the sun struck their ruby wings.

On the 25th of May we deserted the open moor and beat the branches of the alders which grow along some of the mountain burns. *Hypsipetes impluviata* was beginning to emerge, and a week later there were hundreds. They were wonderfully varied, from the pale English form to almost black specimens, and one asymmetrical dark form was obtained. Amongst these trees we also took one *Cidaria miata*, several *Coremia ferrugata*, and two *Selenia illunaria*. *Cidaria suffumata* was widely distributed, though not common, and rather past its best. Amongst the eighteen we took were one or two typical specimens, several

intermediates and one var. *piceata*. Another, a male, was suffused with a reddish brown instead of the black-brown of *piceata*, but unfortunately was a good deal worn.

On the 29th we took a specimen of *Hypsipetes ruberata*, and saw a second. They were in a birch wood, with a few sallows at the edge. Later, two more were taken, one on an aspen.

On May 30th *Lobophora hexapterata* appeared on the aspen-trunks in considerable numbers, showing a good range of colour and markings, including many buff-banded forms, only three of which were males. This variety is almost restricted to the females, as far as my experience goes. Amongst these birches and aspens were several worn females of *L. lobulata*, one with the transverse lines very black, and a second with these partially fused, forming a single central band.

Lobulata lingered on till June 4th, surely a very late date! I have taken them in the same wood on April 10th, in considerable numbers. These aspens proved rich in Macro-Lepidoptera. *Cymatophora or* was first found on June 2nd, and lasted until June 22nd. A few recently emerged specimens were found on the lower part of the trunks; the rest were shaken from the higher branches, often falling into the burn, and affording some excitement before they could be fished out.

On June 2nd we took five *Cidaria corylata*, one being of the var. *albocrenata*. This insect became very abundant later, but only included a small number of the variety. On the aspens we also found one *Notodonta dictæa*, with very white ground colour; one *Lophopteryx camelina* uniformly dark brown with smoky grey fringes and hind wings; several *Smerinthus populi*, also very dark.

(To be concluded.)

NOTES AND OBSERVATIONS.

SCOPARIA FREQUENTELLA AB. PORTLANDICA NOT AT BARMOUTH.—In Entom. xxxviii. 292–3 (1905), the capture of "*Scoparia frequentella* var. *portlandica*" in the Barmouth district, last season, was chronicled by Mr. J. Arkle, whereupon, thinking that so startling a statement required investigation, I wrote to him, and he has kindly obliged me with the loan of the specimen upon which his record was based. It shows no resemblance to ab. *portlandica*, and is not even referable to *S. frequentella*, for it proves to be, most certainly, an ordinary light specimen of *S. cratægella*, Hb. *S. frequentella* ab. *portlandica*, which is clearly figured, though under the erroneous name *phæoleuca*, in Ent. Mo. Mag. v. pl. i. fig. 10 (1869), and in Leech's Brit. Pyr. pl. 15, fig. 5 (1886), is so remarkably localized that, in spite of its having been recorded (as "*phæoleuca*") from Brandon by Leech (*op. cit.*, p. 19), as well as from Ranworth by Winter (Ent. Wk. Int. ix. p. 3 (1860)), my belief that it has not been met with beyond the limits of the Isle of

Portland remains unshaken, though I should welcome the sight of an example from Brandon or elsewhere. Can anyone inform me where the specimens that gave rise to the Brandon or Ranworth records are to be found? In justice to Mr. Arkle, it must be added, that he was misled in the matter by an experienced lepidopterist, who definitely pronounced the Barmouth individual, when it was submitted to him for identification, to be *Scoparia frequentella* var. *portlandica*.—EUSTACE R. BANKES; Norden, Corfe Castle, December 21st, 1905.

THE VARIATION OF THE LARVA AND PUPA OF VANESSA HIPPOMENE, Hüb.—Through the great kindness of Monsieur Georges Autelme, I received three full-grown larvæ of this rare insect—rare at any rate in this island, and now almost extinct. I hope at some future time to give full details regarding its life history and distribution, but for the moment I wish to direct attention more particularly to the very remarkable variation which the larvæ and pupæ undergo when exposed to or partially deprived of sunlight. The larvæ were found when full-grown on the food-plant, which was growing under the shelter of some trees, and only received the direct rays of the sun for a portion of the day only. They differed appreciably, but their colour generally was pale grey with black lines, more particularly on the segments and along the line of the spiracles, and with conspicuous yellow spots, from which arose the branched yellow spines with black tips. The general coloration reminded one forcibly of the larva of the figure-of-eight moth (*Diloba cæruleocephala*). They were placed in an ordinary breeding-cage, in a shady but by no means dark verandah, and pupated the following day, close together at the top of the cage. Though I had never seen the pupæ before, still they all struck me as being remarkably dark, being of deep umber-brown with a few spots of deep gold. By a lucky chance I found an egg of the insect on one of the leaves sent with the larvæ, and this I reared in the same cage and in the same position as the former. This larva was in all its stages a dark grey black, darker than the larva of *V. urticæ* and almost as dark as *V. io*; the usual yellow spots could just be distinguished as deep ochreous or almost chocolate-coloured dots; the spines were much reduced in size, and instead of being pale yellow were obscure salmon-pink. The larva when full-fed was a third less in length than the others, though abundantly supplied with food, and I was, consequently, considerably surprised one morning to find it suspended. I brought the cage into bright sunlight, and surrounded the larva with white foolscap paper, and, as I anticipated, the resulting pupa was pale brown, with numerous spots and splashes of pale gold and silver. The butterfly differed in no way from the others. Professor Poulton, unless I am greatly mistaken, has demonstrated the susceptibility of the larva and pupa of *V. urticæ* to altered conditions; but I am not aware of any Vanessid varying to such an extent as *V. hippomene*, either under natural or artificial conditions. As far as I can recollect, the larva of *V. urticæ* varies but slightly. Possibly all tropical Vanessids vary to the same extent as *V. hippomene*, but I do know that such variations, if they exist, have been recorded. I may add, that the larva which hatched October 8th pupated November 5th, and emerged November 16th, a rate of growth which must cause envy

among the breeders of English Vanessids!—N. MANDERS, Lt. Colonel, R.A.M.C.; Curepipe, Mauritius.

SUGAR AT WITHERSLACK.—At the beginning of July I spent a few days at Witherslack, in company with my friend Rev. J. E. Tarbat, and our experience with sugar was so remarkable as to be worthy of record. It was the kind of experience one hardly expects to have more than once in a lifetime. We sugared for seven nights, and each night, irrespective of varying weather conditions and of nights which did not seem likely to be favourable—clear, cool, or windy—the moths swarmed. On the majority of the evenings we worked a round of trees, partly in an open field, through a little orchard and spinney on the side of a hill, and up to a big tree crowning a knoll. Every tree had numbers of moths upon it, and on coming to this final tree—an ash—in a somewhat exposed situation, my friend remarked, "We shan't have much here, ash is not good for sugar." As he spoke, our lamp shone upon the patch, which was a living mass of insects, coming on while we watched, knocking one another off, tumbling to the foot, and at once climbing up again. On our second round, when we had picked off what we wanted, and had disturbed others, and it being midnight, the moths were getting satiated and some had flown, we counted those that remained on this tree and found there were upwards of seventy on the one patch of sugar. We noted twenty-five species that evening on that one tree. Altogether, on the seven evenings, June 30th to July 7th, we noticed the following species of Noctuæ feeding:—*Thyatira batis* and *T. derasa*, *Cymatophora duplaris*, *Acronycta psi*, *A. rumicis* (including a dark form), and *A. menyanthidis*, *Leucania conigera*, *L. lithargyria*, *L. comma*, and *L. pallens*, *Axylia putris*, *Xylophasia rurea* (and var.), *X. lithoxylea*, *X. sublustris*, *X. monoglypha* (with many very dark forms), *X. hepatica*, *Mamestra sordida*, *M. furva*, *M. brassicæ*, *M. persicariæ*, *Apamea basilinea*, *A. gemina* (and var.), *A. unanimis*, *A. didyma*, *Miana strigilis*, *M. arcuosa*, *Grammesia trigrammica*, *Caradrina alsines*, *Rusina tenebrosa*, *Agrotis segetum*, *A. exclamationis*, *A. corticea*, *A. strigula*, *Noctua augur*, *N. plecta*, *N. c-nigrum*, *N. triangulum*, *N. brunnea*, *N. festiva*, *N. rubi*, *N. baia*, *Triphæna comes*, *T. pronuba*, *Mania typica*, *M. maura*, *Euplexia lucipara*, *Aplecta prasina*, *A. nebulosa*, *A. tincta*, *Hadena dentina*, *H. dissimilis*, *H. oleracea*, *H. pisi*, *H. thalassina*, and *H. contigua*—in all fifty-five species.—(Rev.) W. G. WHITTINGHAM; Knighton Vicarage, Leicester.

OVIPOSITION OF ÆSCHNA JUNCEA AND AGRION MERCURIALE.—In Dr. Drabble's note (*ante*, vol. xxxviii. p. 310) he incidentally states that *Æ. juncea* deposits its eggs while hovering on the wing. This scarcely agrees with my experiences of the species in Surrey. There, by its actions, it gives one the impression that it deposits them in the tissues of plants. I have supposed that *A. mercuriale* does the same thing, but have never seen the process. Has Dr. Drabble had personal experience of the proceedings of *A. mercuriale* when ovipositing? I am afraid we know very little for certain about the early history of dragonflies at present.—W. J. LUCAS.

MELITÆA DESFONTAINII AND M. AURINIA VAR. IBERICA IN CENTRAL ARAGON.—I found these two species flying together last June in a gorge

near a place called El Puerto, about sixteen kilometres south-east of Teruel. *M. desfontainii* was much the more abundant of the two, but most of the males were getting decidedly the worse for wear, when I first visited the locality on June 12th; and even the females, of which however there was no scarcity, had to be somewhat carefully selected. Though occurring in the gorge, too, this butterfly, especially the females, was much more plentiful on the undulating plateaux in the forests above; whereas *M.* var. *iberica* I never took except in the gorge itself. Moreover the latter was, I imagine, only just beginning to come out on June 12th, and was very much scarcer than *M. desfontainii.* I believe, however, that had I remained on at Teruel during a couple of intensely hot, cloudless days (June 20th and 21st), and spent them at El Puerto, instead of packing up on one, and riding my bicycle to Albarracin on the other, I might have secured a good series of *iberica*, which, as it was, I failed to do. But an entomological career, like most others, is full of successful episodes that "might have been."—MARGARET E. FOUNTAINE; Bath, January 23rd, 1906.

A GENERAL EXHIBITION.—The South London Entomological and Natural History Society proposes to hold a General Exhibition of Natural History Objects at their rooms in Hibernia Chambers, London Bridge, on Saturday, March 10th. It will be on the same lines as those that were so successful some years ago. Exhibits from those who are not members will be gladly welcomed. Full particulars may be obtained from Mr. Stanley Edwards, 15, St. Germans Place, Blackheath, S.E.; or Mr. Hy. J. Turner, 98, Drakefell Road, New Cross, S.E.

CAPTURES AND FIELD REPORTS.

EUPITHECIA DEBILIATA, &c., IN LEICESTERSHIRE.—I was fortunate in taking, last summer, in this county, *Eupithecia debiliata*, *Eucosmia undulata*, *Bomolocha fontis*, *Venilia macularia*, *Xylophasia scolopacina*, and *Orthosia suspecta*. The first three species were discovered a year or two ago, by Mr. Bouskell and Mr. Dixon, but I think were not recorded in the 'Entomologist.' *V. macularia* I found some years ago, in an open heathy park, and re-discovered in the same place this year, it feeding apparently on *Teucrium scorodonia*. The two last-named species have not, as far as I am aware, been noticed in the county hitherto. *Bomolocha fontis* evidently feeds, not on *Erica*, as mentioned in Stainton, St. John, and Merrick, but on *Vaccinium*. There was no *Erica* in the neighbourhood, at all events in sufficient quantity, and I verified my conclusion later by finding the larvæ on *Vaccinium*. (Rev.) W. G. WHITTINGHAM; Knighton Vicarage, Leicester.

CRAMBUS FASCELINELLUS IN SOUTH DEVON.—With reference to Mr. Edelsten's note (Entom. xxix. 19) I may mention that I took a specimen of above on the coast near here, on August 9th, 1899, and my friend Mr. B. A. Bower, of Chislehurst, took another in the same locality, when in my company, on the 15th of the same month.—E. F. STUDD; Oxton, Exeter, January 4th, 1906.

SOCIETIES.

Entomological Society of London.—The Annual General Meeting was held on Wednesday, January 17th, at the rooms of this Society, 11, Chandos Street, Cavendish Square.—Mr. F. Merrifield, the President, read an Address on the General Operation of Temperature on the Growing Organism of Lepidopterous Insects, based on a series of experiments, especially with reference to the remarkable limitations imposed by climatic and artificial conditions.—The Report of the Society showed that for the first time in its history the number of ordinary Fellows had reached five hundred. The officers and council were elected for the Session 1906-7 as follows:—President: Mr. F. Merrifield. Hon. Treasurer: Mr. A. H. Jones. Hon. Secretaries: Mr. H. Rowland-Brown, M.A., and Commander J. J. Walker, M.A., R.N., F.L.S. Librarian: Mr. G. C. Champion, F.Z.S. Other members of the Council: Mr. G. J. Arrow, Mr. A. J. Chitty, M.A., Mr. J. E. Collin, Dr. F. A. Dixey, M.A., M.D., Mr. H. Goss, F.L.S., Mr. W. J. Kaye, Mr. H. J. Lucas, B.A., Professor E. B. Poulton, M.A., D.Sc., F.R.S., Mr. L. B. Prout, Mr. E. Saunders, F.R.S., F.L.S., Mr. R. S. Standen, F.L.S., and Mr. C. O. Waterhouse.—H. Rowland-Brown, M.A., *Hon. Secretary.*

The South London Entomological and Natural History Society. —*Thursday, December* 13*th*, 1905.—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—Messrs. Harrison and Main exhibited a series of *Cleoceris viminalis*, bred from Windermere larvæ, showing variation from pale grey to very dark, with captured pale specimens from Barmouth. They also showed *Plusia moneta* from Chertsey and Reigate larvæ.—Mr. Stonell, (1) melanic specimens of *Phigalia pedaria* from Delamere Forest, *Odontopera bidentata* from Skelminthorpe, and *Camptogramma bilineata* from Shetland; (2) *Polyommatus icarus*, females, with male coloration; (3) *Lycæna arion* from N. Cornwall; (4) *Nonagria cannæ* from Norfolk; and (5) *Eupithecia pernotata* taken at Loughton in 1876.—Dr. Chapman, larvæ sent to him by Mr. Murray from Carnforth; they were so densely hairy as to appear almost solid. They appeared to him to be larvæ of *Nemeophila plantaginis*, although he had never known them to hybernate at such an advanced stage in this country. Mr. Murray did not think they were this species. A continental record was mentioned of the species hybernating full fed, when it was densely haired.—Mr. Adkin, series of melanic *O. bidentata* from Durham larvæ, some of which showed whitish lines or markings. —Mr. Goulton, photographs of larvæ *in situ* on their food plant.—Mr. H. Moore, nest of the Durban White Ant (*Termes bellicosus*) and a large species of Wood-louse (*Glomeris*).—Mr. Barnett, dark forms of *Mellinia circellaris*, *Boarmia gemmaria* var. *perfumaria*, and a varied series of *Hybernia defoliaria*, some being brilliantly banded, all from W. Kent. —Mr. Fremlin, *Sirex juvencus* from Maidstone.—The reports of the Field Meetings held at Reigate and at Oxshott were read.

January 11*th*, 1906.—The President in the chair.—Mr. J. W. Schoon, of Bayswater, and Mr. A. A. Dobson, of New Malden, were elected members.—Mr. West, of Ashtead, exhibited a booklet, recently published, containing some sixty admirable photographic reproductions of life-histories and protective resemblances in the Lepidoptera.—Mr.

Hy. J. Turner, male examples of *Morpho cypris* from South America.—Mr. Tonge, a capital photograph of the life-history of *Sesia* (*Macroglossa*) *stellatarum*, ova, larva, pupa, and imago.—Mr. Main, a long and variable series of *Noctua festiva*, bred from Lancashire larvæ, and a photograph of the egg-capsule of *Periplaneta americana*.—Mr. Kaye, a remarkable specimen of *Agrotis tritici*, bearing a close resemblance to *A. agathina*. It was taken with the latter species flying over heather at Oxshott, and was a good example of syncryptic resemblance brought about by the common habit of resting on heather.—Mr. R. Adkin read the Report of the Field Meeting held at Seal on May 27th, and added to it a summary of the characteristics of the area covered by the Society's Field Meetings in W. Kent during the past few years.—Mr. Carr communicated the Report of the Field Meeting held at Chiselhurst and St. Paul's Cray on September 16th.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society.—The Annual Meeting was held in the Royal Institution, Liverpool, on Monday, December 18th, 1905.—In the unavoidable absence of the President, Mr. S. J. Capper, F.E.S., Mr. Richard Wilding, Vice-President, occupied the chair.—The minutes of the preceding meeting having been confirmed, the following were elected members of the Society:—The Right Honble. Lord Avebury, P.C., D.C.L., LL.D. (Farnborough, Kent); George Arnold (University of Liverpool); Eustace R. Bankes, M.A., F.E.S. (Corfe Castle); Geo. C. Champion, F.Z.S., F.E.S. (Woking); Thos. A. Chapman, M.D., F.Z.S. (Reigate); Chas. W. Dale, F.E.S. (Glanvilles Wootton); Rev. H. S. Gorham, F.Z.S., F.E.S. (Great Malvern); Herbert Goss, F.L.S., F.E.S. (Surbiton); Martin Jacoby, F.E.S. (West Hampstead); Gervase F. Mathew, F.L.S., F.E.S., Paymaster-in-Chief, R.N. (Dovercourt, Essex); Professor Raphael Meldola, F.R.S., F.C.S., F.E.S. (London); Frederic Merrifield, F.E.S., President of the Entomological Society of London (Brighton); Claude Morley, F.E.S. (Monk's Soham); David Sharpe, M.A., M.B., F.R.S. (Cambridge); H. R. Sweeting (Wallington); Colonel Charles Swinhoe, M.A., F.L.S., F.E.S. (London); Gerald M. Taylor, M.A. (Rossall); Rev. A. Thornley, M.A., F.E.S. (Nottingham); Commander Jas. J. Walker, M.A., R.N., F.L.S. (Oxford); and Lieut.-Colonel John W. Yerbury, R.A., F.Z.S., F.E.S. (London).—Donations to the library were received from the President of the Board of Agriculture and Dr. Jas. Fletcher, LL.D., F.R.S.C. (Ottawa).—The Secretary announced that the following invitations had been accepted on behalf of the Society:—(1.) From the President and Council of the Association of Economic Biologists, to take part in its third Annual Meeting to be held in the School of Tropical Medicine, University of Liverpool, on December 28th and 29th, 1905, when papers will be read by Mr. Fred V. Theobald, M.A. (Presidential Address), Professors Rubert Boyce, M.B., F.R.S., and Major Ronald Ross, C.B., D.Sc., F.R.S., and Messrs. W. E. Collinge, M.Sc. (two), W. G. Freeman, R. B. Greig, Robert Newstead, A.L.S., F.E.S. (two), M. Steains, and F. V. Theobald. (2.) From the Council of the Liverpool Science Students' Association, to co-operate at an Exhibitional Meeting to be held in the Royal Institution on January 12th, 1906.—The Secretary then read the Report of the Council, showing that the session had been an eminently successful one. The Treasurer (Dr. J. Cotton) then presented his

Balance-sheet, which showed a substantial and increased balance at the bank. On the motion of Mr. Webster, it was resolved to print and circulate the Reports in the Proceedings of the Society.—On the motion of Mr. Tait, seconded by Dr. Edwards, and supported by Messrs. Webster, Stott, Cotton, and the Chairman, a vote of thanks was accorded the retiring Secretary, Mr. Sopp, for his services to the Society during the four years he had held office. It was further resolved that the motion be specially recorded in the Transactions of the Society.—The Annual Address, by Mr. Horace St. J. K. Donisthorpe, F.Z.S., F.E.S., Vice-President, was then communicated. In opening, the lecturer first dealt with the eighteen species of beetles that had been added to the British list during 1905, and afterwards summarized the more noteworthy papers that had appeared in current entomological literature during the year. Later, in discussing the science of entomology, he exhorted members to undertake original research, and to collect with some special object in view. There were the theories of mimicry and protective resemblance; the courtship of insects; the uses of the scents they bear, attractive and repellant; and other equally interesting problems for solution. In many cases he deprecated a protracted waiting for further evidence before venturing to theorize, and insisted on the faculty of imagination, rightly used, being as essential to a scientist as to a literary man, as instanced in Darwin, and referred to the mass of material already accumulated in the museums of the country. The lecturer then passed to a consideration of our indigenous myrmecophilous Coleoptera, a subject with which his name is inseparably associated.—On the motion of the Chairman, a very cordial vote of thanks was accorded Mr. Donisthorpe, whose paper it was resolved to print in full in the Proceedings of the Society.—The following officers were elected to serve during 1906:—President: Samuel J. Capper, Esq., F.E.S. Vice-Presidents: Professor T. Hudson Beare, B.Sc., F.E.S., F.R.S.E.; Richard Wilding; J. H. Bailey, M.B., Ch.B.; E. J. B. Sopp, F.R.Met.S., F.E.S.; Professor E. B. Poulton, M.A., D.Sc., F.R.S.; and J. R. Charnley, F.Z.S., F.E.S. Hon. Treasurer: J. Cotton, M.R.C.S., L.R.C.P., L.S.A. Hon. Secretaries: H. R. Sweeting, M.A.; W. Mansbridge, F.E.S.; and W. Delamere Harrison. Hon. Editor: J. R. le B. Tomlin, M.A., F.E.S. Hon. Librarian: F. N. Pierce, F.E.S. Council: H. St. J. K. Donisthorpe, F.Z.S., F.E.S.; A. Tippins; W. A. Tyerman; B. H. Crabtree, F.E.S.; J. Kidson Taylor; J. F. Dutton; W. Webster, M.R.S.A.I.; F. R. Dixon-Nuttall, F.R.M.S.; Rev. T. B. Eddrup, M.A.; C. E. Stott; R. Tait, Jun.; and P. Edwards, M.R.C.S., L.R.C.P., L.S.A.—The following were reappointed recorders:—Coleoptera, J. R. le B. Tomlin; Hymenoptera, Edward Saunders, F.R.S., F.L.S., F.E.S.; Lepidoptera, F. N. Pierce; Diptera, C. R. Billups, M.R.C.S., L.R.C.P., and E. E. Lowe, F.L.S.; Neuroptera, W. J. Lucas, B.A., F.E.S.; Orthoptera, E. J. B. Sopp; and Hemiptera, Oscar Whittaker.—Exhibits were shown as follows:—British Lepidoptera, by Mr. R. Tait, Jun. Three cases of West African Lepidoptera, captured on the Gold Coast during May, 1905, by Mr. W. A. Tyerman. *S. carpini* as a weasel—a case of mimicry—by Dr. P. Tinne; the moth rests on heather, with head downwards, and antennæ loosely folded to suggest whiskers: the resemblance probably

protects it from attack by birds, &c., and was very effectively shown in the exhibit. The stick-insect, *Tirachoides spectabilis*, from New Guinea, by Mr. J. J. Richardson. The scarce grasshopper, *Megostethus grossus*, L., from the New Forest (presented to the Society), by Mr. W. J. Lucas. *Creophilus maxillosus*, L., with a red thorax, from Ashton-on-Mersey, in November (R. Tait, Jun.); a perfect specimen of the green cockroach, *Panchlora virescens*, Thunb., captured amongst bananas in Manchester (H. Garnett); and the Central American earwig, *Apterygida linearis*, Esch., from the Liverpool Docks, by Mr. Sopp; the latter insect kindly identified by Mr. Malcolm Burr, B.A. Mr. Sopp also showed a photograph, kindly presented to him by Mr. Robert Morley, R.B.A., of the artist's picture "Cornered," now on view in the Liverpool Autumn Exhibition of Pictures. This was greatly admired, the subject being keenly appreciated by all, it being evident that Mr. Morley was a naturalist as well as an artist.

A meeting was held at the Royal Institution on Friday, January 12th, 1906, in conjunction with the Liverpool Science Students' Association and the Liverpool Microscopical Society.—Chas. Stacey Colman, Esq., M.A., The College, Bishop's Stortford, was elected a member of the Society.—The following members contributed exhibits:—Mr. R. Wilding, a drawer of British Aphodii. Mr. E. J. B. Sopp, a series of life-history cards of various British beetles, showing their ravages in certain products of commercial importance, the most interesting being *Triplex ænea* (under holly bark), *Pentarthrum huttoni* (in old ash-wood), *Bruchus rufimanus* (in beans), *B. pisi* (in peas), *Anobium paniceum* (in liquorice and coriander seed), *Lasioderma serricorne* (in cigars), *Dryocætes autographus* (in bark); the two last being of very rare occurrence. Dr. J. Cotton, cocoons of *Dicranura vinula* and *D. bifida*. Mr. F. N. Pierce, an educational case of Lepidoptera—butterflies and moths—rare books, and a beautiful series of insect appendages, which were shown under the microscope. Mr. Wm. Mansbridge, a drawer of North American butterflies. Mr. J. J. Richardson, a drawer of exotic hawk moths.—H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

Birmingham Entomological Society.—*October* 16*th*, 1905.—Mr. G. T. Bethune-Baker, President, in the chair.—Reference was made to the loss of Mr. J. W. Douglas, who was one of the honorary members of the Society, and had been so since its commencement.—Mr. W. Harrison showed *Pheosia tremula*, Cl. (*dictæa*, Esp.), from Selly Oak, which he thought was a new locality for it; also a series of *Nonagria typhæ*, Thnb., from Sandwell Mill Pond; and other local insects.—Mr. G. H. Kenrick exhibited a small collection of butterflies made in Mexico during a recent hurried visit to that country; he had but a few hours on two occasions to give to collecting, so that there were not many specimens. He remarked that the first three butterflies he saw on leaving the city of Mexico to collect were *Pyrameis atalanta*, L., *P. cardui*, L., and *Vanessa antiopa*, L.—Mr. R. S. Searle showed Lepidoptera from Norfolk; *Cirrhædia xerampelina*, Hb., from Feltwell Fen; *Arsilonche venosa*, Bkh., from same place; and *Leucania obsoleta*, Hb., from Denner.—Mr. J. T. Fountain showed some larvæ which he believed to be *Hadena unanimis*, Tr.; they are found in abundance on the Stratford Canal, near Yardley, living in tubes turned up out of the leaves of a sedge-like grass.

November 28th, 1905.—Mr. G. T. Bethune-Baker, President, in th chair.—The Rev. F. D. Morice exhibited the whole of his collection c Chrysids; one boxful of British ones comprising a nearly complete se of those known to occur in this country, and including such rarities a *Hedycridium coriaceum*, Dhlb., of which five specimens were show which are probably all that have been taken in this country. Also si boxes containing the Palæarctic collection, which was wonderfully ric and complete.—Mr. G. T. Bethune-Baker, a very fine collection of Lep doptera received from New Guinea.—Colbran J. Wainwright, *Hon. Se*

City of London Entomological and Natural History Society.— *December 5th.* — Annual Meeting. — Exhibits :— Mr. Cockayne, *E leucophæaria*, thinly scaled, Oxford, February, 1903; also *A. leporin* ab. *melanocephala*, from Warrington. Mr. Edelsten, *N. sparganı* male, with upper wings powdered with black scales and an extra blac spot above the reniform. Mr. Hamling, *R. luteolata* ab., bred Ma 1905, the ground colour being pale, with usual markings on costa ve indistinct, and the apical blotch absent. Mr. A. Harrison, *A. leporin* from Delamere Forest, with black thorax and abdomen and fore wing suffused with smoky black; a melanic series of *C. duplaris* fro Simonswood Moss, Lancashire; *A. ashworthii*, second brood bred i October, from ova laid by imagines reared from larvæ taken in Nort Wales in the spring. Mr. Pickett, a long series of hybrid *S. populi* × *ocellatus*; also specimens of hybrid *C. curtula* × *reclusa*, *S. illunaria* × *illustraria*, and *N. dromedarius* × *ziczac*, the latter resembling the fir species in size and colouring, but having the "pebble" markings *ziczac*. Mr. J. Riches, *O. gonostigma*, second brood, bred, from Bren wood. Mr. Shaw, a long series of *B. muralis*, Torquay, July, 190 varying from very pale to dark green and olive forms.—The treasurer and secretaries' reports having been read, and the officers and counc for 1906 elected, Mr. A. W. Mera read his presidential address.— S. J. Bell, *Hon. Sec.*

OBITUARY.

We regret to hear that Mrs. Hutchinson, of Leominster, died c December 10th. Throughout a long life she seems to have bee devotedly attached to the study of Natural History, but with a speci leaning to the insects, and those more especially that were to be o served in her own district. Her unique opportunities for investigatin the life-history of *Grapta c-album*, and also that of *Eupithecia consignat* were turned to good account, and it is probable that many cabine owe their series of each of these insects to her generosity. Mr Hutchinson contributed many interesting notes, and longer articles, the entomological journals from time to time. In the 'Entomologist for 1881 there is an article from her pen, in which she disproves suggestion that had been made that *G. c-album* was becoming extin in England. The careful manner in which she reared those species c Lepidoptera in which she was specially interested is shown in the cas of *E. consignata*, of which species she presented twelve specimens to th National Collection in 1903. Ten of these were bred in April, 190 and were the direct descendants of a female captured in April, 1874.

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NEW BUTTERFLIES FROM B. GUIANA AND JAMAICA.

(*Two-thirds natural size.*)

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NEW SPECIES OF GUIANA AND JAMAICAN BUTTERFLIES.

BY WILLIAM JAMES KAYE, F.E.S.

(PLATE II.)

THE species of butterflies here described are all from the Guiana region, except the small *Chlosyne*, which is from Jamaica. The latter is of great interest, as indeed are all the species peculiar to this island, as showing how local the insect must be. It is now some years since the specimen was taken, and, owing doubtless to the exact locality (Manchester Mountains) not having since been visited, no further specimens have been taken. The Guiana species include a *Eueides*, which is apparently quite new. This insect has occurred in some numbers, but, strangely, only three males have been taken to some twenty females. The *Papilio* now described may be the female of some known male; but, on the other hand, if it should belong to the *latinus* group, the sexes would be similar, and the now described form would be entirely new. I lean to the latter view, on account of the yellow spots on the sides of the abdomen and the sides of the thorax. The row of red spots coming close up to the subterminal row of yellow spots is also suggestive of the *latinus* group. The Heliconius of the *cybele* group has remained undescribed for years. It is evidently a rare species. Mr. H. J. Adams has the insect also without a name. Unfortunately the *Protogonius* is not here figured. The species or race can, however, now be recognized readily from its special characteristics given below.

Protogonius hippona, Fab., verus.

The identity of this species has so commonly been lost sight of that a description seems badly wanted. There are in existence two specimens of *P. hippona* in the Banksian collection, and these were doubtless identified from Fabricius's type. The

species in some of its forms exhibits yellow instead of white spots to outer margin of hind wing. The large black area of hind wing is the special characteristic of the species.

Fore wing black and tawny, with a heavy yellow band which is very variable in its lower half from beyond cell to outer margin. Apical area black, containing two or three yellow blotches, the uppermost one of which is much the largest. A broad black edging on inner side of transverse band and a heavy black inner marginal band from base to tornus. Inner area of wing fulvous, more yellowish towards its outer confines. Hind wing with the costal half fulvous, a black dash running in towards base from outer margin along vein 7; above this, midway, is a large conspicuous fulvous blotch, well defined by black margins. Lower half of wing heavily black, but variable in extent towards and beyond the cell. Sometimes black irroration extends right across the wing, but more frequently the black area stops abruptly on reaching the lower corner of the cell. A row of large and conspicuous white marginal spots, those beyond the black area becoming obliterated, or only showing indistinctly as yellowish marks. Expanse 106 mm.

Hab. The Guianas (English, Dutch, and French). Lower Amazon.

The species varies considerably. From the very few individuals available for examination, it appears that the form in French Guiana (Cayenne) has a darker hind wing than those from British Guiana (Berbice), and these in turn are darker than those from Paraguay (?), if the latter should prove to be the same species, as is possible. In fact it may be that the vast majority of the described species of *Protogonius* are all one species, with different geographical forms, but all overlapping somewhere or other. Starting with the extremest black hind-winged form from Cayenne, one works through to a lighter form in British Guiana. In Venezuela there is a less black form still, and the band of the fore wing has become broken. Going northward, this reduction of the yellow area becomes more and more marked, until in *T. cecrops* some specimens have a very slender band. In Trinidad, where insularity has worked to bring about greater change, and where there is no fusion of any other race, the form has assumed quite a distinct facies in *T. ochraceus*. Northwestwards, in Columbia, in *T. tithoreides* there is an admixture of the Northern and Southern races: Northern, in retaining the large distinct marginal spots to fore wing; Southern, in showing a reduction in the size of the marginal spots to the hind wing. In Columbia there is a subform of *tithoreides* called *albinotatus*, in which all the spots and band of the fore wing have become white. Going from Guiana westward, one finds a similar form to the British Guiana race in the Lower Amazon. Higher up the same system, on the Rio Madeira, there is a chestnut-coloured form which shows an influence of northern form, but of

this race we know very little, especially as to how the intermediate forms fit in. In Peru the form called *diffusus* shows the yellow band partly obliterated by the ground colour in the lower half, and frequently the apical spots are entirely suppressed. From this form there is a gradation in aberration where the yellow is entirely suppressed, where the colours have become black and fulvous only, but where the hind wing has retained the usual coloration. This form is probably unnamed, but is probably only an aberration of *diffusus*. Lastly, as an extreme in one direction, there is the form *semifulvus*, in which the hind wing is greatly blackened as far as vein 6. Specimens of this are found, showing a transition of the orange band to the yellow band, as found in *diffusus*. Going southwards, no great change is found from the less extreme Guiana forms till one comes to Southern Brazil, where the chief distinction lies in the presence of a longer white apical patch instead of two or three yellow patches. The shape of the yellow band remains much the same as in the Guiana form, in fact almost identical with that of the Berbice specimen. The colouring of the hind wing varies greatly, from fulvous to a shade of lemon-colour, to yellow with a shade of fulvous. It may possibly be due to varying altitudes in some localities where two forms have been received from the same country, as they have been from Colombia and Ecuador. Accurate data are much needed to decide, but there is scarcely a doubt that continuity of forms prevails to a very large extent.

Papilio caburi, n. sp. (Pl. II. fig. 1).

Fore wing deep lustrous ivy-green, the basal half much darker and less lustrous. Hind wing lighter green than fore wing, and with a greater sheen on the costa; reaching to nervure 7 is an oblong patch of cream-coloured scales, and between nervures 6, 7 is just an indication of another patch; before the margin is a row of larger black blotches around the nervures extending to vein 6, where the blotches have become much reduced. Outer margin deeply crenulate, with sharp triangular tooth-like black marks running up between the nervures. Abdomen of the same colour above as hind wing; the sides with three rows of orange patches. On the under side of fore wing ground colour dull blackish; basal half much darker, with a small elongated patch of cream-coloured scales within the cell, lying near lower discocellular. Under side of hind wing blackish, with a marginal row of cream-coloured spots between the nervures, preceded by a row of brick-red heart-shaped blotches. On under side of abdomen is a double row of cream-coloured white dots. Expanse 150 mm.

Hab. Forest between Essequibo and Mazaruni Rivers, near Bartica (W. J. Kaye, April 16th, 1901).

Eueides nigrofulva, sp. n. (Pl. II. fig. 4, ♀ ; 5, ♂).

♂. Fore wing wholly orange and black. The costa black for entire length; the apex very broadly black; outer margin sinuated black; inner margin orange, except just at base, where a longitudinal black streak takes its rise, following the line of nervure 1 *b*, becoming much narrower before outer margin is reached. Discoidal blotch very large, black, hardly joined with the black of costa, and only connected with another large blotch situated between nervures 3, 4 by a small and narrow extension of the blotch; an ill-defined blotch between nervures 2, 3. Hind wing with a very broad marginal band, containing indications of lighter spots, and throwing up short tooth-like marks between all the nervures except between 6, 7. Between the band and the discoidal cell are series of black elongated patches, variable in size and intensity. Thorax with a pair of orange marks and first abdominal segment with another pair. On the under side of fore wing is a row of white marginal spots, largest at apex and smallest at tornus; within the black apex is a band of straw-colour, and again, just within the discoidal blotch, the tint is straw-colour. Under side of hind wing with a lightish area round upper disco-cellular; the black marks within the band very clear and distinct. A marginal row of very distinct large white spots.

♀. With the wings more ample, with the band inside apical black patch straw-coloured, and with the area immediately within the discoidal blotch also straw-coloured. Expanse: male, 82 mm.; female, 90 mm.

Hab. Essequibo River, Potaro tributary (C. B. Roberts, June, November, December, September).

Chlosyne pantoni, n. sp. (Pl. II. fig. 6).

Fore wing above dark black-brown, with deep ochreous markings. Near the base is a narrow obscured ochreous mark; a large irregular ochreous patch, chiefly lying within the cell, but extending towards the inner margin, and a patch of similar colour lying well beyond the cell between veins 4 and 7, extending indistinctly through to the costa. A series of large ochreous subterminal spots lying well in from the margin. On the under side the inner margin and outer margin broadly brownish black; within the latter is a series of spots, which are yellowish towards costa and ochreous towards tornus. The remainder of the wing as on upper side, except that there is a wedge-shaped ochreous mark extending to base, and not a small linear mark. Hind wing above, with the costa, broadly greyish black, the outer and inner margins dark brownish black; the central area of the wings ochreous. Central lunule indistinctly blackish. A large mark from inner margin to just beyond the lower corner of cell dark brownish black. On the under side the ground colour wholly blackish, with a slight ashy tone. In basal half are a number of cream-coloured large blotches. A double subterminal line of festooned whitish marks, preceded by a row of large dark-red spots, which become more and more suffused towards costa. Expanse 56 mm.

Hab. Jamaica (Manchester Mountains).

The species is named after Mr. E. S. Panton, its discoverer.

Heliconius tumatumari, n. sp. (Pl. II. fig. 2).

Fore wing black, the base crimson. A large yellow blotch within the cell, divided from the red area by a roundish black blotch. Discoidal blotch irregular black, joining another black mark just beyond the cell between veins 3 and 4. Beyond the cell are elongated patches of sulphur-yellow radiating round to the costa. Between veins 2, 3 there is a break with the ground colour, and just above vein 2 there is another yellow mark, sometimes elongated, and joining the yellow area with the cell. At the extreme angle of the tornus is an elongated yellow spot, and immediately before apex are three yellow spots, the centre one of which is usually most distinct. Abdomen not marked above, and with a white line running down the centre beneath, bordered on either side with a very fine more or less indistinct white line. Expanse 97 mm.

Hab. British Guiana.

The species is related to *H. cybele*, and from the very few specimens seen is tolerably constant.

Heliconius silvana var. *divisus*, nov. (Pl. II. fig. 3).

Fore wing as in typical *silvana*. Hind wing with the transverse black area divided by a band of the brownish ochreous ground colour as far as vein 5, where there is placed the usual lower yellow spot close to the margin. Both the upper and lower of these spots well defined, but the indications of the remaining marginal spots very ill defined, and hardly distinguishable beyond vein 3. The upper portion of the black area, above the band of ground colour, more arched than in typical *silvana*.

This form is probably a rare aberration only, and not confined to any one locality. Similar specimens occur on the Lower Amazon, as well as in British Guiana, from whence the form is now described.

LEPIDOPTERA AT RANNOCH IN 1905.

By E. A. Cockayne, F.E.S.

(Concluded from p. 40.)

In the birch woods, *Drepana lacertinaria* and *D. falcataria* were met with; the former, much the commoner of the two, was rather darker than the usual English form. *Falcataria* in this district is a most lovely insect. It has an almost white ground colour, crossed by an intensely dark-brown stripe curving round to the hooked wing-tip. *Cymatophora duplaris* was abundant on the smaller branches of the birches. All were more or less melanic, some nearly black.

Coremia salicata and *Emmelesia blandiata* were common locally, the former commoner near the tops of the hills.

On June 23rd *Psodos trepidaria* was flying in profusion on a

bare plateau about 2500 ft. above sea-level. Bearberry has been suggested as its larval food-plant, but I do not think this can be true. They are most abundant on parts of the hill-top where no bearberry grows. The only two plants sufficiently common are crowberry (*Empetrum nigrum*) and lichen. The former seems to me, on the whole, more probable, and we noticed that a great many, females especially, could be disturbed from the tufts of this plant. In a former year I tried the young larvæ on lichen; but, though they lingered alive for a few days, they did not appear to touch it. I hope some day to try with crowberry, perhaps with more success.

Sugaring was an almost complete failure, producing on May 26th two *H. glauca* and two *Pachnobia rubricosa*; June 9th, six *Hadena rectilinea*, one *H. dentina*, eight *Eurois adusta*; June 15th, four *Hadena rectilinea*, one *H. pisi*, one *C. or*; June 22nd, one *Acronycta leporina*, one *A. myricæ*, one *H. rectilinea*, four *H. dentina*, one *E. adusta*, one *C. duplaris*, one *Agrotis porphyrea*, one *Euplexia lucipara*, and one *Eupithecia satyrata*. These were the most successful evenings, and the above include every individual seen at the sugar.

The last three evenings were devoted to catching the males of *Hepialus humuli*, in the hope of finding some approach to the variety *hethlandica*. Though all those taken both near the village and in some meadows four miles along the north shore of the loch were quite typical, the time was not wasted. We were surprised to see that, as soon as the ghost moths began to hover over the long grass, small parties of black-headed gulls arrived, and began crossing and recrossing the fields. Flying very low, they frequently dropped to the level of the top of the long grass, apparently to catch something. By standing under a large elm at the edge of one of the fields we were rewarded by seeing a gull capture a male *humuli*. The birds used to arrive in little parties of two to five, and worked the fields from about 9.30 to 10.30. They then flew off to their home on the island at the head of the loch, about nine miles away. The black-headed gull seems to be the most adaptable of birds, always ready to meet new conditions. However, I must not wander off to talk of birds.

The following is a further list of insects noticed:—*Pieris napi*, *Argynnis euphrosyne*, *A. selene*, *Lycæna icarus*, *L. agestis* var. *artaxerxes*, *Macroglossa fuciformis*, *Euthemonia russula*, *Lasiocampa quercus* var. *callunæ*, *Saturnia carpini*, *Notodonta dromedarius* var. *perfusca*, *Xylophasia rurea* var. *combusta* (one blacker than any I have seen before), *Apamea basilinea*, *Tæniocampa stabilis*, *Phytometra ænea*, *Rumia cratægata* (one aberration with red much reduced), *Cabera pusaria*, *Bupalus piniaria*, *Odontopera bidentata*, *Ephyra pendularia*, *Acidalia fumata*, *Melanippe tristata*, *Melanthia ocellata*, *Coremia montanata*, *C. fluctuata* (dark forms), *C. propugnata*, *C. pectinitaria*, *Emmelesia alchemillata*, *Eubolia palumbaria*, *Eupithecia nanata*, and *Tanagra chærophyllata*.

A few pupæ of *Sesia scoliiformis*, and larvæ of the following insects were also taken: *Pœcilocampa populi* (a lovely variegated form on aspen, and a dull uniform brown one on alder and elm), *Lithomia solidaginis*, *Xanthia ferruginea*, *Plusia interrogationis*, *Tæniocampa populeti* (aspen), *Leucania impura*, *Cleoceris viminalis* (all the black and some green larvæ stung, the remainder producing well-marked imagines running into the var. *obscura*), *Cidaria truncata*, *Larentia cæsiata*, &c. The most interesting results were got from the larvæ of the Oporabias.

On May 29th we beat a few alders, and, finding the larvæ very small, did not try again till June 6th. On that day we beat forty-four from alder, and twenty-nine (for the most part much larger ones) from hawthorn growing on the same hill-side, and one from a birch. From a row of large elms on the other side of the valley we only got fourteen, which were, with one exception, very large. All the larvæ were pure green, except one from the elm, which had a few faint red marks above the spiracles. A day or two later we beat none from elm, and only a few from hawthorn; but there were still many quite small on the alders. By June 10th twenty larvæ from hawthorn and ten from elm had spun their cocoons, while only four out of more than sixty on alder were full-fed. This suggested that those on alder were *O. autumnata*, and the rest *O. dilutata*, as we had expected from the account published by Mr. Allen in the 'Entomologist,' xxxiv. p. 43. As late as June 21st there were still some *Oporabia* larvæ on the alders, and I have a record of finding one on the same food-plant on July 6th, 1901. A few very dark-green *Oporabia* larvæ with dark cheek stripes were found on ling, and three pale larvæ, one with pronounced red markings, were taken at night on sweet-gale. These last failed to emerge, but those from ling produced four *O. filigrammaria* between August 20th and September 8th. Of the other pupæ many produced solitary ichneumons, nearly all identified by Mr. Morley as two species of the genus *Limneria*. Nearly half my pupæ were destroyed in this way. All the larvæ on alder and hawthorn proved to be *O. autumnata*; the imagines emerged from September 13th–October 10th, and varied from very pale to glossy dark-brown forms—one of the former and three of the latter having an almost complete central band. The larva from birch produced a male of *O. dilutata*. From the larvæ on elm three *O. dilutata* (all pale, one with an annular mark replacing the central spot) emerged on September 27th, October 3rd and 7th; one *O. autumnata* on October 4th; and on October 6th two large pale females of *O. dilutata* ab. *christyi*, which seems likely to prove a true species. These results appear to prove that *O. autumnata* in Rannoch is a more general feeder than in the Enniskillen district, where it is never found on hawthorn, even if these trees are growing at the edge of the *autumnata* ground.

NEW AUSTRALIAN BEES IN THE COLLECTION OF THE BRITISH MUSEUM.—II.

By T. D. A. Cockerell.

Halictus.

The following species are black, the abdomen without hair-bands or patches. They are named after well-known Australian explorers:—

	Mesothorax shining, with widely scattered punctures	1.
	Mesothorax dull, very closely or at least (*forresti*) rather closely punctured	2.
1.	Very small; area of metathorax very finely and regularly longitudinally striate	*burkei*, Ckll., ♀.
	Larger; area of metathorax irregularly longitudinally wrinkled	*sturti*, Ckll., ♀.
2.	Area of metathorax with very coarse vermiform ridges	*forresti*, Ckll., ♂.
	Area of metathorax not so	3.
3.	Most of clypeus yellow; size largest, length about 10 mm., male	*warburtoni*, Ckll.
	Clypeus all black; size smaller, females . .	4.
4.	Area of metathorax delicately irregularly reticulate	*mitchelli*, Ckll.
	Area of metathorax finely striate with raised lines	5.
5.	Second submarginal cell large, approximately square, except that the second t. c. slants inwards above	*leichardti*, Ckll.
	Second submarginal cell narrower, much higher than broad	*willsi*, Ckll.

The microscopic characters of these species are as follows:—

(1.) Front.

H. warburtoni.—At sides cribrately punctured, with very large shining punctures, covering the surface; but in middle, below the ocelli, dull, with a very feeble mallear sculpture.

H. mitchelli.—Contiguously punctate all over, the lateral areas not so strongly as in *warburtoni*, and the median area distinctly and regularly, though the punctures are small.

H. burkei.—Dullish, with small but distinct punctures, which are moderately dense; the ground between them is roughened by little lines.

H. willsi.—Not unlike *burkei*, but punctures closer.

H. sturti.—General type of *willsi* and *burkei*, but punctures laterally becoming sparse and weak, and nowhere are they strong.

H. leichardti.—With close small punctures all over.

H. forresti.—With small and quite close, but by no means

contiguous, punctures; hair in middle line and around antennæ very beautifully plumose; hair at upper part of sides simple.

(2.) Mesothorax.

H. warburtoni. — With shallow but large and almost contiguous punctures all over; they are somewhat shiny, and the intervals are smooth. (The scutellum is also extremely densely and strongly punctured.)

H. mitchelli. — Strongly and closely, but not contiguously, punctate on a smooth ground; a few minute punctures interspersed. The interval between the punctures perhaps averages from half to three-quarters the width of a puncture, though in places it is more. (Scutellum has very small punctures, with a few larger ones interspersed; the punctures are mostly scattered, not dense.)

H. burkei. — Rather shining, minutely but very distinctly tessellate, with very distinct but very widely separated punctures.

H. willsi.—Rough, and contiguously punctured all over.

H. sturti. — With widely separated weak punctures, on a rather obscurely tessellate surface.

H. leichardti.—Obscurely tessellate, with rather close strong punctures all over, except that anteriorly the punctures become weaker and sparser.

H. forresti.—Minutely tessellate, with rather shallow fairly close punctures.

(3.) Second abdominal segment.

H. warburtoni. — Basal half well-punctured, on a microscopically tessellate surface; apically the punctures get smaller and much more distant, and the tessellation gives way to a transverse lineolation.

H. mitchelli.—With small regular punctures all over, averaging about as far apart as twice the diameter of one. Ground obscurely transversely lineolate. Hind edge of segment (as also of first) very narrowly light yellow (so narrowly that it is not readily noticed with a lens).

H. burkei.—Dullish, not punctate; the basal part minutely transversely lineolate.

H. willsi.—Minutely and densely, though not contiguously, punctured. The broad depressed apical part transversely lineolate, with minute widely-separated punctures.

H. sturti.—Obscurely lineolate, with only minute scattered hair-punctures. The subapical region has a row of depressed dark bristles.

H. leichardti. — Closely punctate, the punctures small but strong.

H. forresti. — Dullish, with very minute and quite sparse

punctures. Apical part minutely transversely lineolate, with very few punctures.

Halictus warburtoni, n. sp.

♂. Length about 10 mm.; black, the pubescence dull white, with some black or dark fuscous on vertex and dorsum of abdomen; inner orbital margins shallowly subemarginate, converging below; clypeus with rather more than the anterior half light lemon-yellow, the yellow also sending a broad process upwards in the median line; antennæ long, black, the middle flagellar joints bulging beneath; area of metathorax short, shining, with irregular plicæ, bounded by a distinct rim; sides of metathorax covered with white tomentum; legs black, including tarsi; hair on inner side of tarsi slightly yellow; tegulæ large, punctate, dark rufous; stigma large, rather dark reddish, nervures fuscous; b. n. falling just short of t. m., with no interval between them; second s. m. approximately square; first r. n. meeting second t. c.; abdomen rather broad, convex, the hind margins of the segments very dark reddish. The scutellum is bigibbous, with a median depression.

Hab. Hobart, Tasmania (J. J. Walker, 3215). Not unlike *H. lanuginosus*, Sm., but, while the pubescence is of the same general type, it is much less abundant; the head, seen from in front, is broader and more triangular (in *lanuginosus* it is nearly round); the stigma is much larger; the area of metathorax is quite different, &c.

Halictus mitchelli, n. sp.

♀. Length not quite 9 mm.; black, so similar to *H. warburtoni* that at first I thought it might be its mate; but the microscopical characters dispose of this possibility, and the wings are also quite different, the stigma being smaller and yellower (a sort of dull amber), the nervures are lighter, and the first r. n. enters the second s. m. about the beginning of its last fourth. The scutellum is flattened, not bigibbose, and the area of metathorax has an irregular subreticulate pattern of raised lines.

Hab. Hobart, Tasmania (J. J. Walker, 3220). Easily known from *H. repræsentans*, Sm., by the sculpture of metathorax, light stigma, &c.

Halictus burkei, n. sp.

♀. Length about 5 mm.; black, with the abdomen rufo-piceous; the head is dullish, but the mesothorax is very shiny, and when held near the window for examination reflects the blue sky so that one could easily be deceived into thinking it tinted; flagellum dull reddish beneath; area of metathorax dull, covered with very fine striæ; legs rufo-piceous or almost black, the knees redder; tegulæ pale testaceous, with a dark mark in front; wings iridescent; stigma very large, dull reddish brown; nervures light brown, the second r. n. and third t. c. barely discernible; b. n. falling some distance short of t. m.; second s. m. about twice as broad below as above, receiving the first r. n. at about the beginning of its last fourth; abdomen shining above, beneath with much white hair, in which pollen is collected.

Hab. Hobart, Tasmania (J. J. Walker, 3251).

Halictus willsi, n. sp.

♀. Length almost 6 mm.; black, with dull white pubescence; head broad; front and mesothorax appearing granular, hardly shining; flagellum dull brownish beneath; legs black, hairy; hind spur having a broad, strongly divergent, blunt tooth about the end of its first third, and beyond that only a single broad low rounded lamella; tegulæ shining dark rufous, not punctate; b. n. very strongly bent, and falling just short of t. m.; second s. m. higher than broad; first r. n. meeting second t. c.; second r. n. and third t. c. barely visible; stigma and nervures rufous; area of metathorax very finely striate; abdomen broad, dullish; venter with long erect white hair.

Hab. "New Holland," 44 . 4.

Halictus sturti, n. sp.

♀. Length a little over 6 mm.; black, broad, and robust, with scanty white pubescence; clypeus very shiny, with a few large punctures; front dullish; flagellum only very faintly brownish beneath; mesothorax shining, overlapping prothorax in front; post-scutellum with white tomentum; area of metathorax shining and irregularly wrinkled; legs dark rufo-piceous, hairy; hind spur with three little sharp teeth close together about the middle, but otherwise simple; the first of these teeth is shorter and more divergent than the other two; tegulæ large, piceous; wings iridescent, stigma and nervures dark rufo-piceous; b. n. falling a short distance short of t. m.; second s. m. narrowing above; first r. n. meeting second t. c.; second r. n. and third t. c. a little weakened, but very distinct; abdomen broad, shining, pitch-black, the hind margins of the segments as black as the rest.

Hab. Queensland (Gilbert Turner, 631).

Halictus leichardti, n. sp.

♀. About the same size and general appearance of *H. sturti*, but distinguished at once by the strongly fuscous tint of the wings, the broader face, the strongly and densely punctured mesothorax, and the equally densely though more finely punctured abdomen. Scape long, flagellum ferruginous beneath; front, vertex, and mesothorax with some short dark hair; tubercles covered with dull white tomentum; area of metathorax finely but rather irregularly striate, the striæ not reaching its posterior edge; tegulæ rather large, piceous, punctured, though not all over; stigma and nervures dark reddish; b. n. falling some distance short of t. m.; second s. m. large, receiving the first r. n. at its apex; outer nervures as in *H. sturti*; legs dark, hairy, much of the hair dark; hind spur with two rows of very fine teeth, the inner edge bearing closely appressed, pale, sharp teeth, about eighteen in number, the hind edge with less numerous, rather larger, blunter, and darker teeth; the anterior spur has also the row of fine pale teeth, quite the same as on the other; abdomen broad.

Hab. Queensland (Gilbert Turner, 335, Hy.).

Halictus forresti, n. sp.

♂. Length about 6 mm.; black, the anterior half of the clypeus pale dull yellow, the yellow a little produced upwards in the middle line; face narrow; face and front with much short greyish-white hair; scape very short; flagellum extremely long, black; mesothorax dullish; upper edge of prothorax, and tubercles, with much white tomentum; post-scutellum with white tomentum; area of metathorax very coarsely irregularly wrinkled; tegulæ large, dark reddish, with a few minute punctures toward the base; wings clear, iridescent, stigma and nervures dark rufo-piceous; b. n. falling some distance short of t. m.; first r. n. meeting second t. c.; outer nervures distinct; legs black, tarsi dark reddish; abdomen entirely black, the hind margins of the segments shining.

Hab. Queensland (Gilbert Turner, 406, Hy.). Looks much like *H. sturti*, but cannot be its male, the sculpture being so different.

University of Colorado: Oct. 4th, 1905.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC HEMIPTERA OR RHYNCHOTA).

By G. W. Kirkaldy.

(Continued from vol. xxxviii. p. 236.)

Cymatia,* Flor.

Face excavated in the male, convex in the female. No apparent stridular area on anterior femora. Palæ in the male slender, elongate, subcylindric, inferiorly set with a few strong bristles, and terminated by a crooked knife-like claw. In the female the palæ are similar to those of the male, but lack the claw.

The habits are like those in the following genera. There are two British species, easily distinguished by their size, *bonsdorffii* being double that of *coleoptrata*. It is not likely that the other species will be found in Britain.

1. C. bonsdorffii (C. R. Sahlberg). Figured by Saunders and many others; the male palæ are figured by me (Quekett paper). Distributed probably over the greater part of the British Isles †; recorded from Srath glas to Woking, and from Norfolk to Harris. In Ireland, Mr. Halbert has taken it near Dublin. I have taken it freely in the Scottish Highlands and in Surrey, also in Brittany.

* Greek *kyma*, a wave.

† The detailed distribution of the British Aquatic Bugs will be given in an appendix.

2. C. COLEOPTRATA (Fabr.). Figured by Saunders and many others. Plentiful from Lincolnshire to the southern coast, but not very western in its distribution; I have taken it in Kent and Surrey.

It is usually brachypterous, the pronotum being then very small, and the membrane not distinct. Mulsant and Rey described the macropterous form from a single specimen half a century ago under the name of *Corisa fasciolata*; but a few years ago Dr. Horváth captured three examples in Hungary, and generously gave one to me. The pronotum is normally formed, and the membrane distinct.

GLÆNOCORISA, Thomson.
(= *Oreinocorixa*, F. B. White; Saunders.*)

Face hairy, excavated in the male, flattened in the female. Stridulator, stridular area, and strigil present in the male. There is only one, very rare, British species.

1. G. CAVIFRONS (Thomson) (*Corixa alpestris*, Douglas & Scott). Figured by Saunders; male palæ figured by me. Only taken so far in Britain in one locality, *i. e.*, Beinn Chearan, in Srath glas (Ross), in a little tarn on the summit.

CALLICORIXA,† F. B. White.

Face as in the preceding, but smooth. Stridulator and stridular area present in the male, strigil apparently absent. There is always present in both sexes a characteristic black spot on the posterior tarsus (not merely the fringing hairs, but the tarsus itself).

I am unable at present to clear up satisfactorily the species of this genus, and refer the reader to Saunders, and to my paper in the 'Quekett Journal.'

1. C. PRÆUSTA (Fieber). This is generally distributed. I have taken it all over the Scottish Highlands and islands, where it is by far the commonest corixid; also in Kent, Surrey, Middlesex, &c.

2. C. SODALIS (D. & S.). Mr. Saunders seems doubtful as to the validity of this, and all the specimens I have seen labelled as this species are only *præusta*.

3. C. BOLDI (D. & S.). The unique type is, I believe, at Newcastle Museum. It is probably, as Mr. Saunders suggests, an aberration of *præusta*.

4. C. CONCINNA (Fieber). Palæ figured in 'Quekett Journal.' Distributed well over England, though not common; also in the Perthshire Highlands.

* *Glænocorisa*, from *corisa*, a misspelling for *corixa*, generic name, the affix probably being a misspelling for the Greek *glene*, an eyeball, in allusion to the big eyes. *Oreinocorixa*, from Greek *oreinos*, of a mountain.

† Greek *kallos*, beauty.

5. C. CALEDONICA (Kirkaldy) (= *cognata* of Saunders). From Scotland only; rare.

ARCTOCORISA,* Wallengren (including *Basileocorixa*, Kirkaldy = *Corixa*, auctt. = *Glænocorisa*, Saunders).

This is the largest genus of Corixidæ numerically, with eighteen described British species. *Arctocorisa* was separated from *Corixa*, auctt. (i. e., *Basileocorixa*) on a feeble character, *viz.*, the entirety of the pronotal keel, but is unfortunately the oldest available name for the fused genus. The species may be identified as follows, but the males should always be confirmed by my descriptions and figures ('Quekett Journal') of the palæ, &c. The pattern and colouring in forms occurring in the peat districts of Scotland and Ireland often become obscure, so that identification of the females is then difficult. The following table is largely adapted from Saunders:—

1.	Corium not rastrate	2.
1*a*.	Corium rastrate, at least at the base	4.
2.	Dark and pale lines on pronotum equally broad	3.
2*a*.	Pronotum pale with narrow dark lines	*lateralis.*
3.	Pronotal keel nearly half as long as pronotum	*selecta.*
3*a*.	Pronotal keel not more than one-fourth as long as pronotum	*lugubris.*
4.	Species not under 7 mill. long	5.
4*a*.	Species 6 mill. or less	11.
5.	Clavus and corium very rastrate, dull, transverse pale lines very narrow, nearly entire	6.
5*a*.	Clavus and corium not so deeply rastrate, less dull, transverse pale lines wider, much abbreviated and interrupted	7.
6.	Apex of corium usually widely pale, pronotum with seven to eight pale lines	*sahlbergi.*
6*a*.	Pronotum with six pale lines, apex of corium not pale	*linnei.*
7.	Pronotum with six pale lines	*undulata.*
7*a*.	Pronotum with seven (or more) pale lines	8.
8.	Pronotal keel strong, almost entire	9.
8*a*.	Pronotal keel more or less feeble, not reaching to more than half the length of the pronotum	10.
9.	Yellow beneath	*germari.*
9*a*.	Black beneath, with pale margins	*carinata.*
10.	Pronotal angles acute	*striata.*
10*a*.	Pronotal angles obtuse	*distincta.*
11.	Intermediate tibiæ scarcely longer than the tarsi, tarsi and claws subequal	*mæsta.*
11*a*.	Intermediate tibiæ much longer than tarsi, tarsi much shorter than claws	12.
12.	Pronotum not longer than vertex, with five to six transverse, pale lines	13.

* Greek *arktos*, the north; Greek *basileus*, king.

12*a*. Pronotum much longer than vertex, with seven to ten pale lines . . . . . 14.
13. Pronotum with five pale lines . . . . . *scotti.*
13*a*. Pronotum with six pale lines . . . . . *fossarum.*
14. Transverse markings of corium divided by two black longitudinal lines . . . . . *limitata.*
14*a*. Transverse markings divided by three black longitudinal lines . . . . . 15.
14*b*. Transverse markings undulated and interrupted, not continuously divided by black longitudinal lines . . . . . *saundersi.*
14*c*. Transverse markings entire . . . . . *nigrolineata.*
15. Male facial impression deeply excavated and extended high up between the eyes; female palæ short, wider near the base . . . . . *semistriata.*
15*a*. Male facial impression less deep, more parallel-sided; female palæ longer and narrower . . *venusta.*

1. A. LUGUBRIS (Fieber). Generally distributed, but mixed in collections with the next.

2. A. SELECTA (Fieber) (= *lugubris*, Saunders, in part). Described by J. Edwards in 1893 in the Ent. Mo. Mag. Palæ figured by me.

I have taken it in brackish water at Gravesend, Kent. Edwards notes it from the coast marshes of Norfolk.

3. A. LATERALIS (Leach) (= *hieroglyphica*, Saunders). Generally distributed. The ova are figured by Dufour; they are elongate, oval, and pointed anteriorly.

4. A. FOSSARUM (Leach). Generally distributed.

5. A. SCOTTI (D. & S.). All over Scotland.

[*A. prominula* (Thomson), a doubtful Scandinavian form has been reported from Scotland, but the specimens I have seen are merely *scotti.*]

6. A. SAUNDERSI (Kirkaldy). Described by me in the Ent. Mo. Mag. for 1899; and palæ figured in 'Quekett Journal.'

Taken only in one pond in Surrey.

7. A. LIMITATA (Fieber). England from Lincolnshire southwards, and Wales.

8. A. SEMISTRIATA (Fieber). Distributed probably over the United Kingdom, but not common.

9. A. VENUSTA (D. & S.). Same as last.

10. A. NIGROLINEATA (Fieber) (= *fabricii* in Saunders). A variable species in colour and markings. Common and well distributed.

11. A. MŒSTA (Fieber). Generally distributed.

12. A. UNDULATA (Costa) (= *striata*, Fieber). This accords

neither with Linné's type in the collection of the Linnean Society of London, nor with his description. Generally distributed.

13. A. DISTINCTA (Fieber). 14. A. STRIATA (Linné) (=*fallenii*, Fieber). 15. A. SAHLBERGI (Fieber). 16. A. LINNEI (Fieber). All common and generally distributed.

(To be continued.)

AN APPARENTLY UNDESCRIBED SPECIES OF CICADIDÆ FROM CHILI.

By W. L. DISTANT.

Tettigades ulnaria, sp. n.

Body black, brownly pilose; margins of pronotum, lateral and posterior margins of mesonotum, cruciform elevation, rostrum, and legs, ochraceous; a central fascia to base of cruciform elevation and centres of its anterior angles, anterior tibiæ and tarsi, streaks to anterior femora, bases and apices of intermediate and posterior tibiæ, and the tarsi, black; disk of abdomen beneath ochraceous, and in male with a central black longitudinal fascia; tegmina and wings hyaline, talc-like, transversely wrinkled, both slightly sanguineous at base; tegmina with the venation black, the costal membrane, basal cell, the ulnar veins here and there, and the claval suture, ochraceous; in some specimens the apical veins are also more or less suffused with ochraceous; wings with the venation black, more or less ochraceous at base; tegmina elongate, about three times as long as greatest breadth, the ulnar areas long and narrow, parallel, the first, second, and third about equal in length. Long. excl. tegm., ♂ and ♀, 19 to 22 mill.; exp. tegm. 55 to 70 mill.

Hab. Chili (Colls. Dist. and Paris Mus.).

There are three species of *Tettigades* from Chili in my collection which may be thus differentiated.

A. Second ulnar area shorter than first or third.
  a. Tegmina broad, about two and a half times longer than greatest breadth . . . *T. chilensis*, A. & S.
  aa. Tegmina only about twice as long as greatest breadth . . . . . *T. compacta*, Walk.
B. First, second, and third ulnar areas about equal in length.
  aaa. Tegmina elongate and narrow, about three times as long as greatest breadth . *T. ulnaria*, Dist.

NOTES AND OBSERVATIONS.

Great Migration of "Bumble Bees."—On September 1st, 1905, I noticed that a constant stream of bees was passing south, along the narrow strip of sandbanks which divides Poole Harbour from the sea. All the bees were going towards the thousands of acres of heather in the Purbeck Heaths, which were then a most glorious sheet of purple blossom. Of course I expected to see the bees returning to their nests, but, no—although I and several members of my family watched most closely from 7.30 a.m. till dark each day—out of the countless thousands of bees passing we never saw one with its head north, all going steadily south; this went on—the numbers slightly decreasing—till September 13th, and then the direction of the stream of bees suddenly changed and went north; nor did we see any going south again up to the time we left our cottage, on September 29th. A specimen of these passing bees was caught and sent, through the kindness of a friend, to an expert, who names it "*Bombus terrestris*, neuter sex." As I am an invalid, most of my time was spent in a chair out of the house; these passing bees interested me much, and I watched them closely, as did all the others of my family, four or five adults. We talked of the strange phenomenon to any calling friends, yet from September 1st to September 13th none of us saw a bee going north, but countless thousands, in a regular stream, going south; while from September 13th to September 29th all went north. We were on the narrowest part of the sandbanks, where they are only about sixty yards wide, so we could see from sea to sea; and unless the bees returned to their nests across many miles of open sea, or high up in the air out of our sight, there was no return stream from 7.30 a.m. either day up to dark. As a rule the wind was strong, and the bees had to seek the shelter of each bush or tuft of rushes to get on at all. I shall be pleased to answer any inquiries.—Alex. M. Luckham; Combeleigh, Parkstone, Dorset, December 6th, 1905.

The Entomological Club.—A meeting was held in the Entomological Salon at the Holborn Restaurant, on February 6th last. Mr. Verrall, being the host, occupied the chair. Other members present were Prof. Poulton, Messrs. Adkin, Chitty, Donisthorpe, and Hall, and in addition to these there were over sixty guests. At the conclusion of a most excellent repast, which, in accordance with custom, is styled supper, the Chairman, in proposing the Prosperity of the Club, made an exceedingly happy speech, in which he touched on recent matters electoral. A result of the General Election was also the theme of Mr. Merrifield, President of the Entomological Society of London, who proposed the health of Mr. Verrall. Afterwards Mr. Jacoby played several charming solos on the violin, and these musical intervals contributed much to the general enjoyment of the evening.

The Honorary Secretary presented a List of the Members of the Club from the earliest available date down to the present time, and a resolution was passed that this should be accepted, duly recorded in the archives of the Club, and published in the 'Entomologist.' The subject of the Club's collections was mentioned, but not discussed.

CAPTURES AND FIELD REPORTS.

NOTES ON LEPIDOPTERA AT WITHERSLACK.—I was very much interested in reading the Rev. W. G. Wittingham's account of "Sugar at Witherslack," in the February number of the 'Entomologist,' as I spent a week there from the 14th to the 21st July last, at, I believe, the same farmhouse which he made his headquarters. I sugared in some of the same spots, and I think I know the ash-tree which yielded such excellent results. I found sugar fairly good for a day or two after my arrival, but its attraction fell off towards the end of my visit. Being rather late, many of the good things were over; but I took, amongst other moths, a few specimens of *Cerigo matura* and *Caradrina taraxaci*; also one *Acidalia marginepunctata*, which was at rest on a rock. These three species are an addition to Mr. C. H. Forsythe's list for Lancaster and district. Micro collecting was never seriously attempted, but the following is a meagre list of those taken:—*Scoparia cratægalis*, *S. resinea*, *Pyrausta purpuralis*, *P. ostrinalis*, *Crambus pascuellus*, *C. perlellus*, *Tortrix viburnana*, *Amphisa gerningana*, *Sericoris urticana*, *S. lacunana*, *Mixodia schulziana*, *Bactra lanceolana*, *Eupœcilia angustana*, *Xanthosetia zoegana*, *Aphelia osseana*, *Hyponomeuta padellus*. G. W. MASON; Barton-on-Humber.

PHIGALIA PEDARIA (PILOSARIA).—A specimen was taken at rest on a tree-trunk, near the foot, in Claygate village, Surrey, on January 15th last.—J. W. LUCAS.

NOTES FROM CHESTER.—In the Chester district—never particularly noted for butterflies—it is a matter of regret that species like *Vanessa urticæ*, *V. io*, *V. atalanta*, and *Epinephele tithonus* should have shown in the season of 1905 continued evidence of waning numbers. Hedge-cleaning, nettle and thistle-cutting, in previous Julys must have caused the destruction of hundreds, if not thousands, of eggs as well as larvæ. *Cœnonympha typhon* var. *philoxenus* = *rothliebii* still keeps up appearances in Delamere Forest, and in two of the woods it was a pleasure to see numbers of *Euchloë cardamines* on the wing, June 12th, although all the specimens were evidently very near the close of their brief existence. I paid several special visits to Delamere Forest in June in quest of clearwings. *Sesia culiciformis* was the only species secured, and indeed seen—one on the 3rd and a second on the 10th. Both were netted while resting on the leaves of birch in the full sunlight, and pretty pictures they made on their fresh green surroundings. To get rid of "grease" and preserve the beautiful red belt, I plunged them, when set and dried, into benzoline, and left them there for over a week before adding them to my collection. In looking for Sesias I came across about a dozen larvæ of *Geometra papilionaria*, all of which produced fine imagos in the first half of July. *Acidalia remutata*, as usual, was a common moth in the forest in June. On the 10th I captured a fine fresh form having the pale median band on all wings, edged posteriorly with the usual zigzag line, which was very smoke-coloured. *Panolis piniperda* was a common moth during the spring months. Females engaged in depositing eggs along the wire-like leaves of the Scotch firs were occasionally beaten out by day up to the

end of May. About the end of June I beat out a number of the handsome larvæ, hoping to obtain a supply of the grey form of the imago. Both larvæ and imagos have the curious propensity of jumping when beaten out into the umbrella or beating-tray. Larvæ of *Thera firmata* were to be had also in the forest, even in the early days of July—green, with red-brown (rust-coloured) heads; rust-colour on the sides of the first three segments; legs reddish green; segment divisions dorsally reddish, but becoming less distinctly so towards the anal segment. The moths appeared in August, and I took a freshly-emerged specimen at rest on an oak-trunk, August 10th. A good *Macaria liturata* var. *nigrofulvata* (Collins) was seen on July 31st, although the first bred specimen of the season dated back to June 2nd. Larvæ of *Ellopia prosapiaria* = *fasciaria*, also pine feeders, were common until the middle of May. The following notes on the Delamere type-form of the larva, together with varieties, may be of interest. In each case the observations are made on the final stage:—

Type: Head and body reddish, whitish underneath. Segments tipped with darker reddish tubercles. Two dorsal white lines wide apart. Legs and claspers reddish.

Variety 1: As in the type, but white dorsal lines absent.

Variety 2: Head, body, legs, and claspers grey. Tubercles darker. Body speckled minutely with white, especially on sides. No dorsal white lines.

Variety 3: Head, body, legs, and claspers totally black. Body smoke-coloured underneath.

The perfect insect varies in depth of coloration, but not to such an extent as the caterpillar. There is an unusual form conspicuously red.

On June 24th Mr. J. Thompson, of Chester, beat two larvæ (late ones) of *Chesias spartiata* (green with a yellow line along each side) from broom at Delamere. I found the moths well on the wing, September 30th, wherever the food-plant grew; they were plentiful. In August and September I got a fair number of caterpillars of *Notodonta dictæoides* from the forest birch, as well as *Dasychira pudibunda*; while from Scotch fir I secured three of the yellow form of *Bupalus piniaria*. One of the *D. pudibunda* caterpillars appeared one morning, after changing its skin, with all its hairs rose-pink. The moth sometimes appears with a broad dark smoke-coloured band across the upper wings—an infrequent Delamere form.

On August 28th *Cloantha solidaginis*, fine and fresh from the chrysalis, were found plentifully resting on the heather near Rhos, North Wales, by Mr. Thompson. This, I believe, is a new record. I have never taken the larva of *Acronycta tridens*, nor do I think I have ever taken the perfect insect. *A. psi* (with dark forms) is common enough in the Chester district in all its stages, and I am consequently well acquainted with the caterpillar. In fact, as I had never seen the larva of *A. tridens*, I was glad to receive, in August, 1904, as well as in 1905, several of these interesting caterpillars from Mr. Harwood, of Colchester. The following comparative notes on the full-grown larvæ of the two species may be of interest to young entomologists. The chief points of interest are italicised:—*A. psi:* Broad dorsal yellow

stripe, *unmarked*. On each side of the stripe (one on each segment) is a row of large *red spots dotted with black*. An oval-shaped large anal *yellow* spot. *A. tridens:* Broad dorsal *white stripe, marked with red on each segment*. On each side (one on each segment) is a row of large *black spots with white centres*. An anal *red transverse bar*. Both *psi* and *tridens* have a black, dorsal, tufted tubercle on segment five, and both have a dorsal anal tubercle—*yellow* in *psi*, *white* in *tridens*. Both larvæ have black heads. All larvæ of *Acronycta* seem fond of pupating in corks. These should be hollowed out a little with a penknife, and the caterpillars will do the rest. Put as many corks into the cage as there are larvæ, and the latter will find them with unerring discrimination. Another *Acronycta*—*A. megacephala*—deserves a special note. Mr. Thompson took a caterpillar of the species crawling up a poplar tree near Chester on July 11th. The moth emerged, without forcing, on September 10th. A long series of *Boarmia repandata* bred from Delamere Forest larvæ collected in spring from birch, sallow, and hawthorn (they are night-feeders) showed the local form to be indeed a fine one. The moths appear to be unusually large. The colour of the wings is dark grey with warm brown as well as black suffusions, and with paler grey as well as black markings. *Aplecta nebulosa* (Delamere): bred specimens from var. *thompsoni* parents were true to the variety; while those from *robsoni* parents occasionally reverted to the Delamere type. *Acherontia atropos:* Four larvæ were taken in Cheshire in the month of August. One of these was successfully reared to an imago—a fine dark female—February 11th, 1906, by Mr. Sidney Stendall, of the Grosvenor Museum, Chester, after pupating on September 20th, 1905. The pupa was kept in moss damped every other day and placed near a kitchen fire. Mr. Stendall also captured a fine male at one of the electric lamps, September 11th, 1905, at 10 p.m. Both these insects "squeaked," producing a sound similar to that obtained by rubbing a damp cork on a glass bottle. Very interesting observations were made by Mr. Stendall on this "squeaking," and he found that the sounds proceeded from the region of the head, and that in every case the antennæ "shivered" very perceptibly whilst the sound continued. It is curious that in all the records of *atropos* in the 'Entomologist' for the last twenty years I cannot find more than five references where mention is made of this "squeaking" by the perfect insect. "Squeaking" by the pupa is referred to (xix. p. 44), and "snapping" by the larva (xix. p. 16).

The electric lamps seemed in 1905 to be as efficient as ever in attracting moths, but as females appear so seldom, the sport is very one-sided, and becomes monotonous. Casual visits resulted in the capture of a fine *A. leporina*, June 17th; *Plusia pulchrina*, June 27th; *P. iota* and *Habrostola triplasia*, July 9th; *N. dictæoides*, July 28th; a fresh but late *Uropteryx sambucata*, August 24th; and a worn *N. dictæa* on September 7th.—J. Arkle; Chester, Feb. 8th, 1906.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*February 7th*, 1906.—Mr. F. Merrifield, President, in the chair. The President announced that he had nominated Mr. Herbert Goss, F.L.S.; Mr. Edward Saunders, F.R.S., F.L.S.; and Mr. Charles Owen Waterhouse, as Vice-Presidents for the Session 1906–1907. Mr. H. J. Carter, B.A., of "Ascham," Darling Point, Sydney, New South Wales, and the Rev. William Henry Heale, of Wolstanton Vicarage, Stoke-on-Trent, were elected Fellows of the Society. The decease of the Rev. Joseph Greene, M.A., was announced. Mr. W. E. Sharp exhibited a specimen of *Lathrobium lævipenne*, Heer, a beetle new to the British list, taken by him in a sandpit near Oxted, Surrey, in August, 1905, and for comparison therewith the nearest members of the group to which it belongs.—Dr. F. A. Dixey, specimens of South African butterflies belonging to the *Nymphalinæ*, *Acræinæ*, *Danainæ*, and *Papilioninæ*, and remarked upon the odours attaching to them which he and Dr. Longstaff had observed in the field. He drew attention to the significance of the fact that scents of an agreeable nature (as in *Pierinæ* generally, *Mycalesis safitza*, &c.) were, as a rule, confined to the male sex, while those of a disagreeable or disgusting character (as in *Acræinæ* and many Papilios) were often common to both sexes. A discussion followed on the organs and uses of scent as purposes of attraction and defence in insects generally, in which the President, Dr. T. A. Chapman, Mr. G. Bethune-Baker, Mr. M. Burr, Mr. G. J. Arrow, Mr. J. W. Tutt, and other Fellows joined.—Dr. G. B. Longstaff, four species of *Acræa* taken in South Africa during the visit of the British Association, viz.:—(1) *A. anemosa*, Hew., from the Victoria Falls, and Mochudi in Bechuanaland; (2) *A. alboradiata*, Auriv., previously known to Mr. Roland Trimen by two females only, and considered by him as a variety of *anemosa*; (3) *A. atolmis*, Westw., to which Westwood gave the names of *atolmis* and *acontias*, although there seems no doubt they are one species; and (4) *A. atergatis*, Westw.—Professor E. B. Poulton exhibited and read a note upon two Diptera, identified by Mr. G. H. Verrall as a *Chortophila*, which had been observed by Mr. A. H. Hamm following the bee *Andrena labialis*, Kirb. He stated that new and interesting light had been thrown on the observation by Col. Yerbury, who pointed out that both flies were males. At first sight it seemed astonishing that the bees should be pursued by the males of inquiline flies; but Professor Poulton suggested the males in this way find their way to the burrows, where they meet the females, which have also reached them in the same manner, or where more probably they lie in wait for the freshly emerging females.—Mr. W. G. Sheldon exhibited a collection of Rhopalocera made by him in Spain during July and August, 1905, together with typical European specimens for comparison; including an aberration of *A. aglaia*, with the black blotches on the superiors enlarged and banded, and with dark suffused ground colour on all wings, and an interesting series of *L. corydon* and var. *hispana* with examples approaching var. *polonus* from Albaraccin, and intermediates between all these forms, and also British, French, and Swiss typical specimens for comparison.—Dr. G. B. Longstaff read a paper "On some Rest Attitudes of Butterflies," and also a paper "On some

Binomic Points in certain South African Lamellicorns."—Mr. Roland Trimen, F.R.S., communicated a paper "On some new or hitherto unfigured Species of South African Butterflies."—Commander J. J. Walker communicated a paper entitled "Some Observations on the Reproduction of Hemiptera-Cryptocera by Claydon Hewett, B.Sc."—H. Rowland-Brown M.A., *Hon. Sec.*

South London Entomological and Natural History Society.—*Thursday, January 25th*, 1906.—*Annual General Meeting.*—Mr. Hugh Main, B.Sc., F.E.S., President, in the chair.—The balance-sheet showed the financial condition to be very satisfactory, there being some £42 balance.—Mr. Tutt complimented the Society on having such a capital Treasurer as Mr. T. W. Hall, and, in proposing a vote of thanks to him, said that the position of the Society was largely due to his high ability and business judgment. Mr. Montgomery seconded.—The Report of the Council was read, showing that the meetings had been well attended, the exhibits varied and interesting, that nine papers and addresses, three lantern demonstrations, and five reports had been given to the Society, that five field meetings had been held, and that the library and collections were constantly being referred to by the members.—The following gentlemen were then declared elected as officers and Council for the year:—President, R. Adkin, F.E.S.; Vice-Presidents, W. J. Kaye, F.E.S., and Hugh Main, B.Sc., F.E.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, A. W. Dodds; Curator, W. West; Hon. Secretaries, Stanley Edwards, F.L.S., F.Z.S., and Henry J. Turner, F.E.S.; Council, F. B. Carr, T. A. Chapman, M.D., F.Z.S., F. Noad Clark, A. Harrison, F.L.S., F.Z.S., A. Sich, F.E.S., E. Step, F.L.S., and W. West, L.D.S.—Mr. Main read his Presidential Address, at first summarizing the new and rare British species, referring to the obituary of the year, and mentioning the chief works on entomology, &c., recently published. He afterwards turned to the subject of melanism, and, noting the more recent ideas concerning it, went on to discuss and criticise the various theories which had been put forward regarding it. He then introduced Mr. Adkin, the new President, who took the chair.—In proposing a vote of thanks to Mr. Main, Mr. Adkin bore testimony to the able way the chair had been filled during the year, and expressed his appreciation of the solicitude Mr. Main had shown for the well-being and convenience of his fellow-members. Mr. Tutt seconded the vote of thanks, and in eulogistic terms expressed his congratulation to both Mr. Main and the Society on the successful year just passed. In reply Mr. Main thanked the members for their kind reception of him, and said that it had been a real pleasure to him to occupy the chair.

Ordinary Meeting.—Mr. Bellamy exhibited (1) a very fine "black" form of *Anthrocera* (*Zygæna*) *trifolii*, captured at Ringwood on June 25th, 1899. It was afterwards ascertained to be the var. *obscura*; (2) an extreme form of *Polyommatus corydon* var. *fowleri* from Swanage, July 30th, 1899, in which the spots on the white border of the hind wings are almost absent; and (3) a yellow form of *Callimorpha dominula*.—Mr. Turner, a number of species of butterflies taken by Dr. Chapman in late July at Larche and Lauteret, including *Colias palæno*, *Polyommatus damon*, *P. escheri*, *P. orbitulus*, *Epinephele lycaon*, *Erebia lappona*, &c.—Mr. Edwards, the pupa-cases of *Cionus scrophu-*

lariæ among the seed-vessels of *Scrophularia nodosa*, showing the remarkable resemblance. He also showed specimens of *Papilio patros* and *P. photinus*.—Mr. Lucas, specimens of the stag-beetle, *Lucanus cervus*, dug up from their cocoons at Kingston in early January.—Mr. Tonge, for Mr. Vine, a pale yellow, bipupillate form of *Epinephele ianira*, and a photographic life history of *Euchloë cardamines*.—HENRY J. TURNER, *Hon. Report Secretary*.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*January 15th*, 1906.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. James Simkins, Brooklands, Solihull, was elected a member of the Society.—Mr. A. H. Martineau exhibited the gall and sexual forms of *Biorhiza terminalis*, Fab., and also the root gall and agamic form of the same species, known as *Biorhiza pallida*.—Mr. Gilbert Smith showed living specimens of the new British beetle, *Tetropium crawshaii*, Sharp.—Mr. J. T. Fountain showed a box of Lycænidæ from several localities, including *Lycæna astrarche* var. *salmacis*, Stph., from Castle Eden Dene, and also one which he said he had taken at Weston-super-Mare.—Mr. G. T. Bethune-Baker exhibited a box of Lepidoptera from the Fiji Islands, including some striking Sphingidæ; also six species of Hepialidæ from the Fiji Islands. He pointed out that the scent-glands at the base of the wings of the Hepialidæ were strongly developed, and said that when he received the specimens the scent was still quite strong and resembled incense.—Mr. G. H. Kenrick exhibited several drawers from his collection, containing fine series of various Pieridæ, including in particular some of the species received by him from his collector in New Guinea.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

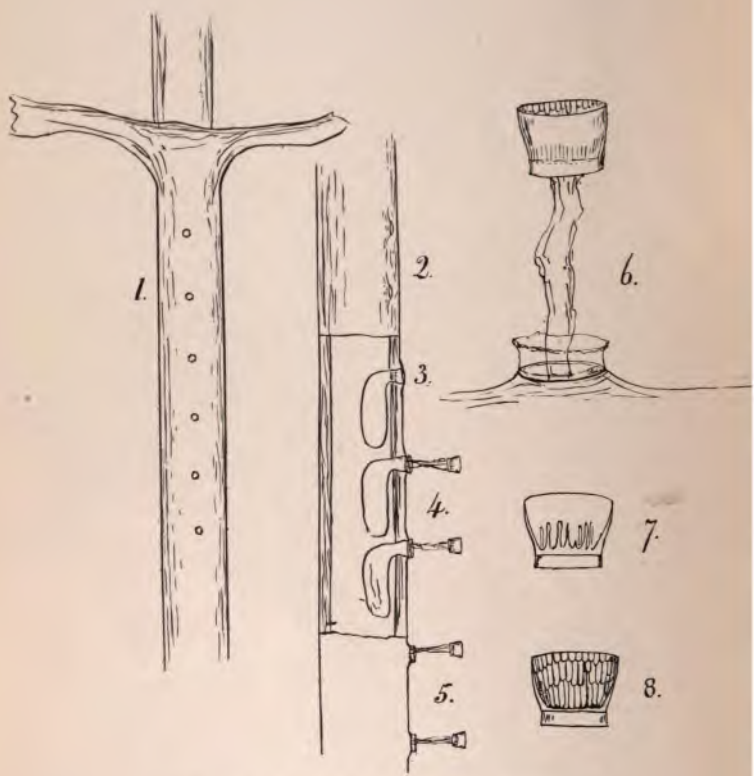
LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — The usual monthly meeting of this Society was held in the Royal Institution, Liverpool, on Monday, February 19th, Mr. Richard Wilding, Vice-President, in the chair. The meeting took the form of a joint meeting with the Liverpool Microscopical Society. Professor Geo. Henry Carpenter, B.Sc., F.E.S., was elected a member of the Society. The following exhibits were made, *viz.*:—By Dr. J. Cotton, a long series of *Triphæna fimbria* and *T. pronuba*; the series represented the range of variation as met with in the St. Helens district very fully, the rarest form shown being of a unicolorous dull brown, with none of the usual markings visible.—Mr. F. N. Pierce, microscopical preparations to show the difference between the androconial scales and the ordinary scales of *Thecla rubi*; the dissimilarity between the form and depth of the scars, left on the removal of the scales, was also strikingly illustrated.—Mr. E. J. B. Sopp, British Phytophagous Coleoptera, including series of *Chrysomela cerealis*, *Hydrothassa hannoverana*, and other local and scarce species; also a lovely photograph of the egg-capsule of *Periplaneta americana* (cockroach) taken by Mr. Hugh Main, B.Sc.—Mr. R. Wilding, two very rare beetles, viz., *Tetropium crawshayi*, a species new to science, and *Amara anthobia*, new to Britain; both from Leighton Buzzard. Mr. W. A. Tyerman, three cases containing about one hundred butterflies and moths taken by himself on the Gold Coast during April, 1905. The fine condition and great beauty of these insects were much admired. In addition to the above, Mr. McPhail, Mr. F. N. Pierce, and other members of the Microscopical Society, showed many slides

illustrating insect morphology, and thus contributed to the general knowledge of the members of the Society.—H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

City of London Entomological and Natural History Society.—*December* 19*th*, 1905.—Exhibits:—Rev. C. R. N. Burrows, three specimens of banded form of *T. orbona*, from Mucking. Mr. Harrison, a long series of *E. viminalis*, bred from larvæ taken at Windermere in June, 1905, varying from light to very dark grey. Mr. Hodgson, three male *L. bellargus*, taken within ten days of early September frosts, which were of a decided slaty coloration as compared with specimens taken before the frosts occurred. Mr. Pickett, *C. pamphilus*, Dover, August, 1905, including two males with strongly marked black marginal bands; also *A. grossulariata*, bred December 15th, from larva taken October 21st. Mr. Shaw, *B. perla*, from Torquay, July, 1905, including var. *flavescens* (Tutt). Messrs. Mera and Prout, cabinet drawer containing *M. hastata* and its allies. Mr. Prout also exhibited various foreign forms and allies of *M. hastata*.—Mr. Prout read a paper entitled "The *Rheumaptera hastata* Group."

January 2*nd*.—The first meeting of the new year was devoted, as usual, to a "pocket box" exhibition. Among the numerous exhibits the following may be noted:—Mr. J. A. Clark, melanic specimens of *Malenydris multistrigaria* from Huddersfield.—Mr. G. R. Garland, bred *Angerona prunaria* from Monmouth and Essex parents; the offspring of two banded parents consisted of many typical forms and a small proportion of banded imagines, while typical parents produced two banded imagines. Mr. Garland also exhibited a fine striated female *Spilosoma lubricipeda*, approaching var. *radiata*, captured at Leyton in June, 1904.—Mr. T. H. L. Grosvenor, *Hylophila prasinana*, bred from Tilgate in 1904, with the area between the silver lines on fore wings occupied by a white band.—Mr. H. M. Edelsten, *Colotois pennaria* from Epping Forest, with the wings powdered with black scales.—Mr. A. Harrison, a long series of *Aplecta nebulosa*, bred from larvæ collected in Delamere Forest in the spring of 1905; the specimens ranged from the ordinary pale grey form to var. *thompsoni*, 11 per cent. being more or less melanic.—Mr. L. B. Prout, *Nonagria sparganii*, bred in August, 1905, from pupæ taken in East Kent, some miles from the old South-east Kent locality.—Mr. V. E. Shaw, an aberration of *Aglais urticæ*, captured at Bexley in August, 1905, with hind wings entirely black and the marginal bands on the fore wings much wider than usual.—Mr. A. J. Wellsdon, a specimen (? unique) of *Acronycta leporina* from South Essex, the upper wings being entirely black and the under wings darker than the type; also a gynandromorphous *Agrotis puta*.

January 16*th*.—Dr. T. A. Chapman exhibited *A. villica* female var. *konewkai* from Sicily, April, 1905, together with other specimens bred from ova laid by the captured female. In this variety the white spots tend to form transverse fasciæ.—Mr. A. W. Mera, a living female imago of hybrid *Nyssia lapponaria* × *N. zonaria*, one of eleven females bred to date, no males having emerged.—Mr. V. E. Shaw, larvæ of *Epunda lichenea* reared from ova laid by female taken at Torquay; the larvæ, although all were in the same stadium, varied from light to dark green and brown.—S. J. Bell, *Hon. Sec.*



EGGS OF *NABIS* (*LATIVENTRIS?*).

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THE EGGS OF *NABIS* (*LATIVENTRIS*?).

By T. A. Chapman, M.D., F.E.S. &c.

(Plate III.)

At the beginning of last July I found on our downs here, stems of *Chlora perfoliata* with certain circular marks. These were about 0·21 to 0·24 mm. in diameter, were slightly raised—*i.e.* the surface round them sloped triflingly up to their margins. Their position was very regular and orderly, generally on the second or third internode above the ground, though occasionally higher; they were placed in a regular line down one side of the stem in numbers varying, but generally from about four to eight, rarely only one or two; they were almost always at exactly equal distances from each other—*viz.* about 2·0 mm. These proved to be the eggs of a species of *Nabis*, Dr. Sharp believes *lativentris*; the only ground for supposing it to be some other species being that that species is more widely distributed than *Chlora perfoliata*, and therefore if it be *lativentris*, it must be in the habit of ovipositing in various other stems—a highly probable circumstance, since *Nabis*, not being a vegetable feeder, merely the mechanical qualities of the stem can be of any importance. At any rate, the young bugs that hatched from these eggs are certainly some species of *Nabis*. By the time some of these had hatched, and I had learned what the little circles were, I found that (about July 10th) the further eggs discoverable in the field were also hatched, and so my notes on them are founded chiefly on the empty shells, though I had previously determined by section that they were eggs containing developing embryos.

The stem of the *Chlora* consists of a delicate bark, then a dense woody layer about 0·2 mm. thick, and a centre, hollow or with a delicate pith. The eggs occupy a hole directly penetrating the woody layer, and then bend down in the central pith for about 1·2 mm., swelling out a little in it. How they are placed here I do not know, but no doubt when the oviposition

takes place earlier in the season, the stems are comparatively soft and fleshy, and it is not so difficult a procedure as it looks in the hard woody stems I found. Nevertheless I notice that the vegetable fibres are not thrust aside to more than a slight extent, and many look as if they were cut across to form the hole. This hole is very smooth and very circular. The egg-shell in the pith, after the bug is hatched, is quite a substantial colourless bag.

When the egg hatches, it opens by an elaborate lid or stopper, being pushed off, or rather out. This lid occupies the whole thickness of the woody layer, and when pushed out leaves the whole of the tube in this layer lined by egg-shell, so that it is more like a stopper in a bottle than a lid. When pushed out it does not fall, but remains attached to the egg by several twisted films, which retain it, at a distance of about half a millimetre, in a position as if its being pushed back into its place were contemplated. This stopper is of a white pith-like texture and highly organized structure. It is a slightly conical tube, with a diaphragm near its inner opening; the outer surface is longitudinally striated. The inside is impressed with hollows in several irregular series, such as might be made, if it were on a larger scale, by making grooves with rounded ends from the edge to the bottom, whilst it was still soft material, by pressure of a finger, then repeating this in a shorter series and again by another, with only the finger tips within the margin. The flat bottom has also a number of upright, slender processes, sometimes branched, half the height of the hollow they are in.

I have not been able to find any account of the egg-laying of *Nabis*, and one is at first rather surprised to find a carnivorous species laying its egg in plant-tissues. Herein, however, it is quite parallel with *Nepa*. Dr. Sharp (Camb. Nat. Hist. vi. p. 561) refers to some Capsids that have a similar habit.

Betula, Reigate: February, 1906.

EXPLANATION OF DIAGRAM.

FIG.

1. Portion of stem of *Chlora perfoliata* × 5 diams., showing disposition of the circles formed by the tops of eggs.
2. More in profile to show prominence × 9.
3.* Section of stem showing unhatched egg × 9.
4.* Section of stem showing two eggs empty × 9.
5. Appearance in profile of undisturbed empty egg-shells × 9.
6. Appearance of a hatched egg × 50.
7. Section of lid of egg to show processes from bottom of cup × 50.
8. Section of lid to show sculpturing of interior of cup × 50.

All these are more or less diagrammatic, and do not profess to be drawings.

* In smaller stems the eggs pretty well fit the pith cavity.

1

2

3

A NEW EGYPTIAN FLEA (*PULEX CHERSINUS*).

Figs. 1–5. Figs. 6–10.

SOME FORMS OF *APLECTA NEBULOSA* FOUND IN BRITAIN, CHIEFLY IN DELAMERE FOREST, CHESHIRE.

A NEW EGYPTIAN FLEA.

By the Hon. N. Charles Rothschild, M.A., F.L.S.

(Plate IV.)

Pulex chersinus, sp. nov.

Closely resembles *P. nubicus*, Roths., Ent. Mo. Mag. (2), xiv. p. 84, n. 2, t. 2, fig. 10, 16 (1903), but differing in the following characters :—

The hind coxa bears posteriorly at the apex three bristles instead of two, and on the inner surface a comb of four or five spines. All the femora have two bristles ventrally near the apex. The tarsi are shorter than in *nubicus*, the proportion of the segments being different. The fourth segment is nearly as broad as it is long, being cup-shaped (fig. 1). The fifth segment bears ventrally at the apex three short stout bristles in all the tarsi (fig. 2).* The proportions of the mid-tarsal segments are 7, 12, 6, 4, 10 in the new species, and 9, 13, 7, 4, 10½ in *P. nubicus*, the proportions of the hind tarsus being 24, 17, 10, 6, 12 in the new species, and 27, 19, 10, 6, 12 in *P. nubicus*. It will be noticed that the first and second hind tarsal segments are shorter in *chersinus* than in *nubicus*, while the distal segments are the same in length.

Modified segments : The clasper bears two processes as in *P. nubicus* (fig. 3), the lower one being distinctly broader than the upper. The processes are of equal length, while in *nubicus* the lower one is much shorter than the upper. The lower process bears one long and several horter bristles at and near the apex, the most proximal bristle of the dorsal side being situated at the apical fifth, the corresponding bristle being placed a little beyond the middle in *P. nubicus*. The ninth sternite resembles that of *nubicus*, but is distally somewhat narrower.

We have received one male, off *Jaculus gordoni*, from Khartoum, through the kindness of Dr. A. Balfour, of the Wellcome Research Laboratory.

NOTES ON SOME FORMS OF *APLECTA NEBULOSA* IN BRITAIN.

(Plate V.)

In the group of specimens of *Aplecta nebulosa*, arranged and photographed by Mr. H. Main (Plate V.), the object has been to show the extensive colour range of variation to which this species is subject in Britain.

The pale specimen (fig. 1), which is from Ireland, has the ground colour almost pure white (owing to screen marks this is slightly obscured in the figure). Fig. 2 represents a New Forest

* *These bristles have* come out too black in the figure.

specimen, and this also has the white coloration. Var. *pallida*, Tutt, is described as white, with the markings almost obsolete, and fig. 1 is possibly near this. Figs. 3–5 are grey forms, and are more or less typical examples of the species, and figs. 6–10 show various modifications of the melanic race occurring in the Delamere Forest, from which locality the specimens 3 and 5 were also obtained. Of the melanic forms, figs. 8 and 10 represent *robsoni*, Collins, and *thompsoni*, Arkle, respectively. Except that fig. 10 has a white crenulate line on the outer margin of the fore wings, and that the fringes are white instead of brownish grey, it is not otherwise very clearly separable from fig. 8, which has been recognized by Mr. Collins as agreeing with his type of *robsoni*. Now, it will readily be seen that figs. 6 and 9 are more unlike figs 8 and 10 than the latter are to each other. It follows then that if it be considered necessary to have names for two modifications of the melanic race, names must also be given to all melanic specimens that are not identical with figs. 8 or 10. Further, the process would not end here, but would have to be extended to the various gradations in the grey form, and to those in the white form also. An alternative course would be to use varietal names only for the main departures from the typical grey coloration, and these are already provided—in *pallida* for the white ground forms, and *robsoni* for the black forms.

The grey form is perhaps more generally distributed in Britain than either of the others, but in some counties—as, for example, in Berkshire—the grey and the white forms both occur, but not in the same wood. The white form appears to be the dominant one in the West of England and in Ireland, and examples of it have been found in Scotland. The melanic form is confined to Delamere Forest and South Yorkshire. Mr. A. Harrison informs me that this form is certainly increasing in numbers in the Cheshire locality. From larvæ collected there in 1905 he reared 11 per cent. of the melanic form, and of these one specimen only had pure white fringes (fig. 10). In 1904 the melanic specimens had been only 5 per cent., and in several previous years the number had been lower than 5 per cent.

Mr. Harrison adds:—"The larvæ of *A. nebulosa* are most found on young birch trees, a few only occurring on sallow, hawthorn, and bramble. They outnumbered all the other Noctua larvæ put together in the part of Delamere Forest that I collected in. They are far more numerous in the Cheshire locality than in Epping Forest or the New Forest—at least, that has been my experience."

RICHARD SOUTH.

TWO NEW SPECIES OF *PRONOPHILA* FROM ECUADOR.

By Percy I. Lathy, F.Z.S., F.E.S.

Pronophila rosenbergi, n. sp.

♂. Upper side: Fore wing dark olive-brown, paler towards base and outer margin; an obliquely placed subapical white band, with white spot below it; two diffused pale spots on outer margin—fringes whitish between nervules—one above the other below lower median nervule. Hind wing dark olive-brown, paler towards base; fringes whitish between nervules. Under side: Fore wing paler than above, especially at apex, which is grey and reddish brown speckled with dark grey; apical white band wider and more diffused towards outer margin, and with two white spots below it, and on its inner edge traces of blue-centred black ocelli. Hind wing mottled grey and reddish brown; a wide irregular reddish brown band across basal third, this band highly angled on its outer edge; beyond this a row of obscure ocelli, blind, excepting two at anal angle, which are blue-centred; outer margin reddish brown.

Allied to *P. thelebe*, D. & H., but may be separated by subapical white band, and the more variegated under side of hind wing.

Pronophila unifasciata, n. sp.

♂. Upper side: Fore wing dark brown, paler towards base and apex; three subapical reddish patches, the centre one being the largest, and two patches of similar colour below these, having on their inner edge traces of ocelli. Hind wing uniform dark brown. Under side: Fore wing paler than above, especially at apex; reddish markings larger and brighter, with exception of lower spot, and on their inner edge three blue-centred black ocelli. Hind wing greyish brown, base dark brown, an irregular wide dark brown band crossing wing at end of cell, this band highly angled on its outer edge; beyond this a row of obscure ocelli, the two at anal angle being most conspicuous; outer margin dark brown.

Nearest to *P. timanthes*, G. & S., but may at once be distinguished by single row of reddish markings of fore wing above; *P. timanthes*, G. & S., also has a row of five ocelli on fore wings below, and in the new species there are only three, and they are more obliquely placed.

The types of both the new species here described are in the collection of Mr. Herbert J. Adams, F.E.S. I have seen one specimen of *P. rosenbergi* in the Hewitson Collection at the British Museum, and there are also two specimens in the Brit. Mus. Coll. from Peru, which probably belong to this species. Of *P. unifasciata*, there is a specimen in the Brit. Mus. Coll. without locality, and three specimens in the Godman and Salvin Coll. from Ecuador. Mr. Adams has one example of each species.

DESCRIPTION OF A NEW SPECIES OF *ODYNERUS* (*LEIONOTUS*) FROM AUSTRALIA.

By P. Cameron.

Odynerus (*Leionotus*) *bisulcatus*, sp. nov.

Black; a small mark, rounded above, over the antennæ, a broad curved mark on either side of the clypeus above two marks, broad on the outer side, gradually narrowed on the inner side, on the pronotum, a small mark on the sides of the scutellum, a small line or mark on the angles of the metanotum, a large mark, longer than wide, transverse at the base, rounded at the apex and below, on the mesopleuræ below the tegulæ, the apex of the latter and a band on the apex of the first and second segments of the abdomen, the second broader and more irregular than the first, and extending on to the ventral surface, where the band is four-lobate, the outer lobes being more developed than the inner, yellow. The knees and tibiæ reddish testaceous, as are also the tarsi, except at the base and apex. Wings hyaline, infuscated in front and at the apex. Clypeus in male entirely yellow. Female and male. Length, 12 mm.

Head and thorax densely covered with fuscous pubescence, that on the head longer and denser than it is on the thorax; the abdomen pruinose, the apical segments pubescent. Front and vertex rugosely punctured, the punctures running into striations below. Clypeus pyriform, longer than broad, shining, strongly but not closely punctured; its apex has a shallow but distinct rounded incision, the sides below forming distinct triangular teeth; above the incision there is a distinct curved depression. Temples broad; behind the top of the eyes is a small yellow spot. Thorax twice longer than wide, transverse in front, the sides at the base above distinctly angled, the part between the angles margined. Mesonotum flattened at the apex, where there are, in the centre, two, three times longer than wide, furrows or depressions. Scutellum flat; the post-scutellum is more prominent, more rugosely punctured, and is gradually narrowed behind. Angles of metanotum somewhat broadly rounded; the metanotum is almost transverse; there is a deep distinctly defined furrow down the middle. First abdominal segment cup-shaped, large, pedunculated shortly at the base, narrowed compared with the second segment; its apex is slightly raised, and there is a short depression in the middle before the apex. The second segment is large, narrowed at the base; looked at from the side the base above is seen to be obliquely depressed; on its basal ventral half is a distinct longitudinal central furrow; the segment is not tuberculate. The male clypeus is yellow; it is longer than wide; its apex is roundly incised, the sides forming triangular teeth; the antennal hook is stout, black, and about three times longer than wide; the spot on the sides of the scutellum is minute, and there is none on the sides of the metanotum; it is more slender, more densely pilose than the female, and the legs are of a brighter, more rufous colour.

Comes near to *O. bizonatus*, Boisd. sec. Sauss.; that species

should be known by the apex of the clypeus being transverse, and having two keels close to the base; its base of thorax, too, apparently is not angled laterally. *O. vernalis*, Sauss., is an allied species; it has a tubercle on the second abdominal segment on the back. Neither with *O. vernalis* nor with *O. bizonatus* does Saussure make mention of the two deep furrows or depressions on the apical half of the mesonotum. In my species they are distinct in both sexes. *O. vernalis* has an indistinct suture on the first abdominal segment. The term "circular," used by Saussure (Vespides, i. 148) to describe the clypeus of *vernalis*, is certainly not applicable to the clypeus of my species in the female, the only sex described of *vernalis*.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC HEMIPTERA OR RHYNCHOTA).

By G. W. Kirkaldy.

(Continued from p. 64.)

17. A. germari (Fieber). 18. A. carinata (C. R. Sahlberg). I discussed these two fully in the 'Entomologist' for 1898 (xxxi. 249-51), and figured the palæ in the 'Quekett Journal.' In translating Wallengren's Swedish in the former, however, I made a bad mistake, to which Dr. Bergroth kindly called my attention. "Hvarjämte uppehållsorten synes vara en annan" has no reference to the structure of the bug, but means "the habitat also seems to be different," *germari* having been found in a small lake with muddy bottom, far from the sea; while *carinata* lives in small pools on rocks at the seashore, and, in Lapland, on Alpine rocks.

Corixa, Geoffroy.

(= *Corisa*, Amyot & Serville; *Macrocorisa*, Thomson.*)

Of the general structure of *Arctocorisa*, but smooth and polished, and the strigil is on the left side of the male. There are two British species:—

1. Pronotum with at least sixteen pale lines . . *geoffroyi*.
1*a*. Pronotum with not more than fourteen pale lines . *affinis*.

1. C. geoffroyi, Leach. Generally distributed. The ova are figured by Dufour and others; they are subglobular, pointed anteriorly.

N.B.—The Scandinavian *C. dentipes*, Thomson, has been confused with *C. geoffroyi*, but the intermediate tibiæ are compressly dentate at the base in both sexes. It may possibly be found in Britain.

* Greek *koris*, a bug; Greek *makros*, big.

2. C. AFFINIS, Leach (= *atomaria* in Saunders). Generally distributed. Variable in size and pattern.

Fam. NOTONECTIDÆ.

The Notonectidæ have also sprung apparently from a Naucoroid stem, and are usually placed in classifications between the Naucoridæ and the Corixidæ, an absurd position. They are perhaps of all insects the most perfectly adapted for an aquatic existence, their structures being very interesting.

They have been recently investigated systematically by myself.* They are characterized by the rostrum being composed of from three to four segments, the antennæ of four, the insertion of the anterior legs on the *posterior* margin of the prosternum, &c.

There are two British species, each belonging to a subfamily:—

1. Posterior tibiæ and tarsi ciliate; sternites keeled and ciliate; rostrum with four evident segments. Eyes large. Size over 13 mill. . . . NOTONECTA.

1*a*. Posterior tibiæ and tarsi not ciliate; sternites neither keeled nor ciliate; rostrum with three evident segments. Eyes small. Size under 8 mill. . . . . PLEA.

NOTONECTA,† Linné.

The species of this genus are properly called "water-boatmen," though of late years American authors have termed them "back-swimmers," transferring their true title to the Corixidæ. In France they are named "Punaises à avirons," and in Germany "Ruderwanzen," both referring to their oar-like posterior legs.

The head is rounded and very declivous; the eyes very large, the boatman thus being able to look out, both above and below, for "inside-fares." It is carnassial, feeding on any living thing that it is strong enough to surprise or overpower, particularly other waterbugs, larvæ of Ephemerids, &c. The rostrum is stout and the setæ sharp, inflicting a burning smart when the bug is heedlessly seized; so severe, indeed, that it is supposed that some poisonous matter must be injected simultaneously from the salivary glands.

The method of respiration is very remarkable. The boatman is very buoyant, owing to the quantity of air taken in reserve and its position along the sternites (which of course are uppermost), so buoyant indeed that the insect is compelled to use considerable exertion to remain submerged. They are fond, especially during hot weather in the daytime, of remaining

* Trans. Ent. Soc. Lond. 1897, pp. 393–426; and Wien. Ent. Zeit. 1904, pp. 93–135.

† From Greek *noton*, a back; *nekho*, I swim.

stationary at the surface, but on the slightest suspicion, a few strokes of their powerful oars drive them instantly far from danger. The under side of the abdomen, *i. e.*, the deck of the boat, slopes inwards on either side, so that there are two large gutters between the strong central keel and the equally strong outer sides; these sides and the central keel are bridged over all along by thick layers of coarse, oblique hairs, one layer to each side from the central keel, and one from each side to the keel, thus forming a waterproof upper deck. When the boatman rises to the surface for air, the apex of the body projects a little out of the water, the air passes along the tunnel each side under the hairs; along the bottom of the tunnel (or gutter) are six pairs of spiracles into which the air passes. Under water this supply of air is very noticeable, seeming like a mass of mercury.

The anterior pair of legs is raptorial; the middle pair is used for clinging to stems of weeds, &c., while at rest; in this position the posterior legs stand out at right angles to the longitudinal axis of the body, this latter pair being long, with the tibiæ and tarsi densely ciliate. Their speed through the water can be very great, but on land their gait is very clumsy, their progression being effected by a sort of shuffling hop. They are provided with strong organs of flight, and use them indeed with good results.

Copulation takes place beneath the surface of the water; the abdominal segments are telescopic, and the terminal segments are thrust out beyond the apices of the tegmina, so that the spiracles are still protected from the water. The male mounts the female at first in the usual way, but soon after slips down so that the sexes lie almost in the same plane, side by side, the male a little lower; they swim thus, attached only by the genitalia, as quickly almost as when separate.

Observations on the metamorphoses have been made by Roesel, Régimbart, Dufour, De Geer, Girard, Bueno, Enock, and myself; while embryological researches have been made by Heymons, Will, Pedaschenko, Pantel, Sinéty, and others; at the same time full descriptions and figures of the various stages in this, as in all other British waterbugs, are much needed.

The ova of *N. glauca* are oblong, cylindric; they are usually inserted, for about three-fourths of their length, in incisions made in the stems of rushes, or other aquatic plants, though sometimes they are only lightly affixed thereto, or, in exceptional cases, deposited on the bottom, though possibly ova found scattered promiscuously thus may have originally been so lightly affixed to the stem of some plant that a subsequent jar dislodged them. Régimbart has figured the ova of *N. glauca* in situ, and he enquires the reason of these insects thus concealing their ova in plants. At first sight, he says, there is reason to suppose

that it is to protect them from numerous enemies, *viz.*, fish, insects, and so forth. He thinks, however, that the hatching time of the young nymphs tends in general towards the end of winter and the middle of spring, and rarely continues after the end of April. It is not so with copulation and oviposition, which take place particularly in winter and spring (and also in summer and autumn). The ova may thus wait many months after oviposition before hatching. As the level of the water is subject to being lowered, they would find themselves liable to exposure to the air and consequent desiccation; but, as it is, they are concealed in a plant which protects them, and furnishes them with the moisture indispensable to their preservation. Later, the rains of autumn and winter raise the water-level, and the nymphs being again submerged, hatch, and find the conditions necessary to their development.

The ova hatch in about fifteen days, diving down head foremost on emerging, and there are four nymphal instars (in part roughly figured by De Geer), the young swimming upside down from the first.*

Notonecta is subject to water-mites, as are the other aquatic bugs. The odour emitted by the boatman is apparently of a fæcal nature, at least no openings similar to those in *Ilyocoris* have been found; it is very similar to that of the plant "stinking goose-foot" (*Chenopodium vulvarium*).

Notonecta has been found by Enock to be subject to the attacks of a Hymenopterous parasite, viz., *Prestwichia aquatica*, which oviposits in the ova of the *Notonecta*.

There is but a single British species:—

1. N. GLAUCA, Linné. Varies in general colour from pale ochreous to black; in all the mature British examples I have seen the scutellum is black, but in a North African variety it is yellow. The following varieties are well-marked, though intermediate forms occur:—

(a) *glauca*, Linné. Tegmina pale ochreous, more or less specked laterally, &c.; abdomen above black, lateral margins narrowly pale.

(b) *marginata*, Thunb. Tegmina black, with two elongate ochreous spots on the clavus, &c.; abdomen as in the preceding.

(c) *marmorea*, Fabr. Tegmina rich yellow-brown, mottled with a darker brown; abdomen as in the preceding.

(d) *maculata*, Fabr. Tegmina orange irrorated with brownish red and blackish brown. Abdomen above orange banded with black.

A beautiful variety from the Canary Isles (*canariensis*, Kirkaldy), which may be a good species, has purple-black tegmina, irrorated with dark rich castaneous.

* According to Régimbart, the nymphs of Corixidæ present, at their exclusion from the egg, no trace of air on their ventral surface; they are heavier than the water, and appear to commence taking in air only at the end of four or even six days.

Notonecta glauca is generally distributed; var. *maculata* is more local.

N.B.—*Notonecta lutea*, Müller, has been recorded from Britain; and pale specimens of *N. glauca* are, or were, exhibited in the General Insect Gallery of the British Museum as *N. lutea*. *N. lutea* is not likely to occur in Britain, and is a very different species.

(To be continued.)

ON TWO SPECIES OF HYMENOPTERA FROM THE CAPE DE VERDE ISLANDS.

By P. Cameron.

Odynerus atlanticus, Cam.

In the 'Entomologist' for January last (p. 13), I described a wasp under the above name, which it has borne in my collection for many years. Unfortunately I overlooked Mr. W. F. Kirby's paper on the "Hymenoptera of the Challenger Expedition" in the Ann. and Mag. Nat. Hist., May, 1884, where the same species is described, fortunately under the same name, if somewhat briefly.

Priocnemis atlanticus, Kirby.

♀. Length, 21 mm. Antennæ reddish yellow, the scape of a redder hue, and thickly covered with pale golden pubescence; the third joint is about one-fourth longer than the next. Eyes converging slightly below; the ocelli in a curve; the hinder separated from the eyes by almost twice the distance they are from each other. Clypeus boldly convex; its apex narrowly depressed, black, transverse, the sides rounded. Temples short, roundly narrowed. Angles of pronotum broadly rounded, prominent. Post-scutellum more prominent than the scutellum, clearly raised above it, roundly narrowed to a point above, there being a fine keel in the centre. Striation on metanotum strong, becoming coarser towards the apex. Pleuræ obscurely obliquely striated. Abdomen with a greenish iridescence; the pygidium is densely covered with bright red pubescence, sparsely intermixed with longish soft black hair. Radial cellule short; the third abscissa of the radius is one-fourth shorter than the second; the third transverse cubital nervure from shortly below the middle is straight and obliquely curved towards the second; the second recurrent nervure is received the length of the third abscissa of the radius from the base of the cellule. The head and mandibles are brownish, darker on the centre of the vertex and front.

Mr. Kirby describes this species, *l. c.* p. 408. The description therein given may be usefully supplemented from an example taken by Commander J. J. Walker at St. Vincent.

The sides of the pronotum project more prominently than in most African species—than in e.g. *Salius tamiseri*, Guér.; the antennæ, too, appear to be longer and more slender than usual.

ALGERIAN BUTTERFLIES IN THE SPRING AND SUMMER OF 1904.

By Margaret E. Fountaine, F.E.S.

Algeria is a country which would seem to present great possibilities from an entomological point of view, with its lofty mountains, immense forests, and scorching hot plains, with its rich vegetation in the north, and tracts of arid desert in the south. Whether my expectations were altogether realized during the six months from February to August, 1904, that I spent collecting here in "The Garden of Allah," will best be determined by reading the results of my efforts; which I may add seem to me to have been scarcely adequately rewarded. I was at Biskra towards the end of February, where I found *Euchloë charlonia* and *E. falloui*, flying in company with *E. belemia* on the tops of all the low, desert mountains from which, however, the two first-named, at least, never seem to descend, so that the climb up to these stony heights was almost always entirely unproductive of results; though towards the end of March, *Melitæa didyma* var. *deserticola* began to appear in the dried-up tracts of desert between these mountains, but it was far from common, as the season was an extremely backward one, and high winds, not altogether sultry at times, blew almost every day without intermission. At El Kantara, too, where two years previous (1902) Mrs. Nicholl and I had found *E. pechi* quite common on the alfa grass slopes of the surrounding mountains at the end of February and beginning of March, now under the influence of this unsatisfactory season, which was wet as well as cold at El Kantara, I did not see it at all till the 6th of April, and then the males seemed only just to be thinking of coming out. After this I returned north of the Atlas mountains, and visited Hammam R'Irha (a beautiful place, with an excellent hotel, but not much good for collecting); also the cedar forest above Blidah (3500 ft.), where I spent a week and found *E. eupheno*, very plentiful, and a few other things. The trees in this forest are not nearly so large as those in the great cedar forest at Teniet-el-Haâd; but I should imagine that in the summer it might afford excellent collecting, especially for Argynnidæ, as the forest glades were carpeted with purple pansies, and this genus was most sparingly represented in any of the other localities I visited; neither did I see elsewhere the purple pansies. After I had spent a week here in the little pension of Les Glaciers, (most comfortable, and on the borders of the forest), I proceeded to Teniet-el-Haâd (3500 ft.), where I arrived on May 19th. I certainly did better during the five weeks I spent here than anywhere else in Algeria, and the cedar forest was a sight never to be forgotten: for a distance of twenty-five kilometres the moun-

tains are clothed with these magnificent trees, the highest point in this vicinity rather exceeding 5000 ft. All day long strange bright-winged birds sang their wild, untutored songs, till the very heart of the forest seemed to throb with melody; the flowers, too, in the open, sunny glades were a dream; and the butterflies were far from disappointing. Indeed, I have never seen such a profusion of insect-life in any place before; beetles of every hue glittered in the hot, mid-day sun of an African summer, bees in gorgeous apparel of brilliant scarlet, enormous grasshoppers of every shape and form, flies of many colours, though with irritating propensities, not to mention a great monster ant-lion (a kind of *Palpares*) flopping awkwardly about, as though his soft, gauzy wings were so big he did not quite know how to manage them; with now and then a vividly coloured dragonfly, that I would fain capture, but did not always succeed in doing.

But the insects in this much-favoured spot became too much of a good thing at last, and on the last occasion that I visited the cedar forest, flying and crawling earwigs suddenly appeared in such appalling myriads that actually I was obliged to beat a hasty retreat. So numerous were they that all other insect life seemed, by comparison, to be temporarily suspended; the air was full of them, flying as high as the tops of the trees, not thousands, but millions of them, every square foot of ground, every piece of fallen timber, in fact everywhere and everything was infested with these disgusting creatures; they crawled all over us, and soon proved that they were of a kind that knew how to bite. "Ils piquent aussi, ces perce-oreilles"! remarked indignantly a French lady, who (for her sins), in company with some friends, was "making picnic" in the forest that day. As for me I ordered our horses to be saddled, and once mounted rode away as hard as I could, still covered with these loathsome insects, the manes of the horses, too, being full of them. Neither were the earwigs the only disadvantage I had to contend with that day; the weather had become so intensely hot, that the best piece of hunting-ground (a meadow of rich grasses, asphodels, and other flowers, just below the forester's cottage) was now the favoured haunt of numerous snakes. I caught one in my net once, instead of the butterfly I was trying for; luckily she lost no time in forcing an exit for herself through the thin gauze, and escaped with much alacrity back into the thick, damp grass, a line of conduct on her part which met with my absolute and entire approbation. But all this was only on my last visit to the forest, and the preceding weeks had left nothing to be desired. Though I could not help observing that as the summer advanced there had been a decided falling off amongst the butterflies, those which had come out so abundantly towards the end of May and early in June were going over now, and no fresh species

were appearing to take their place. So that this fact, together with my experience with the earwigs, decided me to move on into the province of Oran, and make for Tlemçen and Sebdou.

I arrived at Tlemçen (2800 ft.) on June 21st, and the next day bicycled with my courier, over an excellent though mountainous road to Sebdou (3100 ft.), distant thirty-five kilometres from Tlemçen. Here I found *Cœnonympha fettigii* just out and in excellent condition on June 27th. But it soon became evident that my expectations of Sebdou were doomed to disappointment. It was a wretched little place too, with nothing but a couple of wayside inns for accommodation, while most of the inhabitants were either Jews or Arabs. The country in some directions presented a semi-demi desert appearance; the heat in July became intense, but though in the middle of the day the shade thermometer would stand from 100° to 110° Fahrenheit, the nights were sometimes so cold that it would drop as low as 40°! In the plains at sea-level the thermometer frequently stood at 122° Fahrenheit during this terrible summer, which it may be remembered was unusually warm everywhere, so that I suppose the Algerian climate rose to the occasion proportionately.

I had never before seen any country in the month of July so (almost) destitute of butterflies as this, and ten days I spent at Tlemçen proved that neighbourhood to be even worse. When I returned to Sebdou (July 22nd) I found *Pieris daplidice* var. *raphani* had come out in great abundance; most of the males belonging more or less to this well-marked variety, though amongst the females it was comparatively rare. On July 26th I first took *Satyrus fidia* var. *albovenosa* and *S. statilinus* var. *hansii*, Aust., near Sebdou, and these two Satyrids soon became common on all the surrounding mountains up to about 5000 ft. But, alas! *S. abdelkader* failed to appear, so I began to think my note stating that this interesting Satyrus was "common in the alfa grass, near Sebdou, in August," was a fraud. Anyhow I never came across it, though I searched diligently wherever there was alfa grass in abundance, till the middle of that month, when fever put a summary end to my collecting for that year.

The following is a list of my captures:—

Papilio podalirius var. *feisthamelii*, Dup., and ab. *lotteri*, Aust.—Near Algiers in March (1902); and in the cedar forest above Blidah in May the var. *feisthamelii* was not uncommon. The summer brood at Tlemçen and Sebdou produced ab. *lotteri*, very large and white. A larva I found on a peach-tree near Sebdou in August produced a small specimen of *feisthamelii* almost minus the short black stripe from the middle of the costa on the upper wings. It was brought out by artificial heat on February 6th, 1905.

P. machaon, L.—On the desert mountains near Biskra in March; the specimens were rather small, but do not seem to me otherwise to differ appreciably from the type, except one, which is ab. *sphyrus*, Hb.

But the summer brood of this butterfly in Algeria seems to present a very fine form. In one female I have, taken by my courier near Sebdou in July, the ground colouring is most brilliant, and the abdomen is entirely yellow, thus being analogous with the form *zanclæus* of *podalirius*. Unluckily the very rapid flight of this insect prevented my taking others; however, one which I failed to catch I saw was distinctly the same, and another in a very mutilated condition, which I took later, had evidently also belonged to this form, which would, I suppose, be considered an extreme of var. *aurantiaca*, Spr.

Thais rumina, L.—Taken rarely at Hammam R'Irha in April. I also came across a small colony near Blidah on May 18th; and at Teniet in the forest, &c., it was common in certain places where the *Aristolochia* grew in May and June. The specimens from Hammam R'Irha have the red blotches on the upper wings very nearly replaced with black. All the Algerian specimens are paler in colour than those I took some years ago in Andalusia.

Aporia crataegi, L.—Abundant at Teniet in May and June.

Pieris brassicæ, L.—At Hammam R'Irha and other localities in April and May.

P. rapæ, L.—Not very common at Biskra and El Kantara in March. In the cedar forest above Blidah in May I took a perfectly white male, entirely devoid of all black markings above and beneath.

P. napi, L.—In both the cedar forests in May.

P. daplidice var. *raphani*, Esp.—This is a very marked form of the summer brood; in some of the male specimens the yellow-green markings on the lower wings, under side, are almost entirely confined to the outer margins, leaving the central area creamy white. With the female it was less so. This butterfly was extremely common all round Sebdou in July; I also observed it at Tlemçen.

Anthocharis belemia, Esp.—At Biskra and El Kantara in March; var. *glauce* at Blidah and Teniet in May.

A. falloui, Allard.—Quite distinct from the preceding species, and with a little practice can even be distinguished from it on the wing. It flew on the tops of all the desert mountains round Biskra; but seems entirely confined to the region of the desert, not occurring even so far "inland" as El Kantara.

A. belia, Cr.—At El Kantara in March (1902). Also near Blidah (cedar forest) in May. Most of the Algerian specimens are small, and have an inclination to black markings along the outer margins of the hind wings, especially in the females.

A. pechi, Stgr.—This seems to be a rare butterfly in collections; but it flew commonly enough on all the mountains near El Kantara in February and March (1902). In 1904 the season was so backward that I did not see a sign of it till April 6th, and then it was still very rare, apparently only just emerging. It does not seem to descend into the desert region, and always flies where there is plenty of alfa grass.

A. charlonia, Donz.—This extremely pretty little butterfly flies commonly in February and March round El Kantara and at Biskra, where it is to be found in company with *A. falloui* on the tops of the desert mountains.

A. eupheno, L.—Abounds everywhere north of the Atlas Mountains;

I also saw one male specimen at El Kantara in March (1902). Both sexes vary much in size; and a few of the females I took near Algiers in March (1902) approach the var. *androgyne*, Leech.

Teracolus daira var. *nouna*, Luc.—It was especially the desire to catch this little butterfly that caused me to revisit Biskra this year; but though Mrs. Nicholl had been able to secure easily a good series of it in that neighbourhood during March, 1902, and had also kindly informed me exactly how, when, and where to look for it, I did not come across a single specimen. Perhaps, like *A. pechi*, it was fully a month late, or it may have been such a bad season that it was extremely rare; anyhow, I had to come away without it, and bear my disappointment as best I might. But the unexpected happens to collectors of butterflies just as it does to everyone else, and it was a most unexpected event for me when, on June 27th, on a mountain near Sebdou, I took one male of this species. It was just fresh out, so much so that, though it was the middle of the day, its flight was slow and halting, and it therefore fell an easy prey to my net. Of course, I imagined that a summer brood was now beginning, the elevation being about 4000 ft.; but though I visited the "Nouna Mountain" again the next day, and on many other subsequent occasions, I never saw another!

Colias edusa, F.—Pretty common everywhere. Also the var. *helice* at Sebdou in July, where I took one very fine specimen of the intermediate form, in which the ground colour on all the wings is a pale primrose yellow.

Gonepteryx cleopatra, L.—Common at Teniet in June. The orange patch in the males seems to be slightly less intense than in those I have from the South of France.

Pyrameis cardui, L.—Common everywhere.

Vanessa polychloros var. *erythromelas*, Aust.—This magnificent form of the "greater tortoiseshell" occurred commonly at Teniet-el-Haâd in June; it was not out in the end of May. The ground colour is a vivid orange-red, and it is much more distinct from the type than I imagined at the time, or I might have secured a longer series; but *erythromelas* is a rapid flier and most difficult to catch, the street gutters in the town of Teniet offering perhaps the best chances of a capture. Though the ground colour of this Algerian form is even deeper in tone than any specimen I have ever seen of *V. zanthomelas*, S. V., still it fails to present the other distinctive features of that species, inasmuch that the legs are brown, the light-coloured marks near the costa on the fore wings are yellow and not white, while the brown shadings on the under side of all the wings are darker instead of lighter. So that it cannot possibly be classed as *zanthomelas*, though bearing a strong superficial resemblance to it.

Melitæa ætherie var. *algirica*, Stgr. — Occurred commonly in the cedar forest and other localities near Teniet in May and June. A few of the specimens appear to be typical, and are indistinguishable from some I have from Spain, taken near Seville, but far the greater number belong undoubtedly to the var. *algirica*.

M. didyma var. *deserticola*, Obth.—Taken at Biskra in March and April. Also an intermediate form at Sebdou in June and July; approaching the type from Teniet in June.

Argynnis pandora, S. V.—As I did not spend the summer where the purple pansies grew in the Blidah cedar forest, this seems to be the only *Argynnis* I met with in Algeria, and it was far from common. I observed it at Teniet, and, I think, at Sebdou.

Melanargia lucasi, Rbr.—I caught my first male on May 24th, about three minutes' walk from the town of Teniet-el-Haâd. A week or ten days later this butterfly was swarming everywhere in that neighbourhood. Some of the females were very richly coloured underneath. It seems to me to combine some of the characteristics of *M. iapygia* and *M. galathea*, but does not very closely resemble either of them.

M. ines, Hffgg.—Not very common on the hills round Teniet. A brightly marked form.

Satyrus briseis var. *major*, Obth.—Not by any means widely distributed. I came across a colony of it near Terney, a place about halfway on the road between Tlemçen and Sebdou, in July. It was also abundant in certain mountains about fifteen kilometres west of Sebdou on August 9th, but the specimens were no longer fresh. It was a very large form, nearly twice the size of an ordinary Central European *brisris*.

S. semele var. *algirica*, Obth.—Very abundant all round Teniet, end of May and throughout June. The males on the upper side show an inclination to assuming the coloration of typical females, whilst the females themselves are more brightly coloured than the type, but not so much so as in var. *aristæus*. It also occurred commonly at Sebdou.

S. statilinus var. *hansii*, Aust.—Very common near Sebdou, end of July and August, frequenting the foot of mountains.

(To be concluded.)

NOTES AND OBSERVATIONS.

Thecla rubi.—In the report of the Lancashire and Cheshire Entomological Society, I am credited with exhibiting microscopical preparations to show the difference between androconial scales and ordinary scales of *Thecla rubi*. This was not the object of the exhibit, and I am afraid our good secretaries have missed the point I specially wished to call attention to, which was—the male *Thecla rubi* has the power of entirely shedding the androconial scales in the little patch on the fore wing. If your readers will examine their series with a lens they will probably find in the specimens selected to show this patch most distinctly that all the androconial scales have been shed, leaving the ordinary scales quite perfect. Are they connected with scent-glands?—F. N. Pierce; The Elms, Dingle, Liverpool.

Unusual Dates of Emergence of some Moths.—On June 24th, 1905, I received some larvæ of *Macaria alternata*. They were then about a week old, and pupated between July 7th and 12th. One imago emerged on July 18th, which is about the normal time for the second brood specimens to appear, and I expected that all the moths would emerge. No others, however, came up until December 20th, when I

found one in the breeding-cage. A third followed on January 5th, and a fourth on February 5th. Some larvæ of *Nemoria viridata* hatched on June 16th, 1905, from eggs deposited on the second of that month. These pupated in due course. One imago emerged on December 20th of that year, and one on each of the following dates this year—January 8th and 14th, February 2nd and 12th. A male specimen of *Orgyia gonostigma* emerged on November 5th, 1905. The larva from which this resulted pupated on September 26th. Another larva that pupated on October 16th produced a female specimen on November 20th. Two larvæ of *Dasychira pudibunda* that pupated in August, 1905, attained the perfect state on February 12th, 1906.—ARTHUR J. SCOLLICK; 8, Mayfield Road, Merton Park, Wimbledon.

A NOTE ON CHRYSOPHANUS ALCIPHRON ab. INTERMEDIA (Stephanelli).—Under remarks (Wheeler's 'Butterflies,' p. 16) of a tendency in var. *gordius* to be larger and brighter on the south side of Alps than in the Rhone Valley, mention is made of a female taken by me at Varzo, of which the hind wings are suffused with black, and to a fine black female of Mr. Rowland-Brown's from Val Malenco. I have lately had an opportunity of seeing this latter, and it is practically the same variety as mine from Varzo. Hitherto I had supposed that it was unnamed. But on reference to Drs. Staudinger and Rebel's catalogue the other day, I found ab. female *intermedia*, Stephanelli, thus described: "Al. ant. disco fulvo, al. post. *ut in Alciphron*." This exactly agrees with the above varieties, and most curiously with what Mr. Wheeler says, speaking of my Varzo specimen, "This closely resembles a female in the Geneva Museum from Hyères, *marked Alciphron*." No doubt this, too, is ab. *intermedia*. I therefore subjected all my Varzo and Iselle *gordius* (?) to a strict examination, and find that of four other females two at least are very much darker and more suffused with black on the secondaries than any specimens from the Rhone Valley; while the males, of which I have preserved seven, show a tendency to a very general suffusion of purple, after the manner of *alciphron*. One specimen has the primaries entirely a rich purple-brown, with the black spots showing through, as in type *alciphron*, only the spots are large as in *gordius*. Others approximate more or less this coloration. This extreme specimen, then, I take to be ab. *intermedia*, male, and that this aberration is not confined to the female sex. Two males from Val Anzasca resemble these Italian Simplon forms. Staudinger gives Central Italy as the locality for ab. *intermedia*.—FRANK E. LOWE.

THE INSECT FAUNA OF SUSSEX.—In the 'Victoria History of the Counties of England,' Sussex, vol. i., is an account of the insects of the county. This comprises lists of all orders, occupies 128 pages, and is a valuable addition to these county lists. Mr. Herbert Goss is editor of this division of the work, and other well-known entomologists have compiled or otherwise assisted in the preparation of the lists as follows:—Orthoptera (3 pp.), Mr. Malcolm Burr. Neuroptera (5 pp.), Mr. W. J. Lucas. Hymenoptera Phytophaga, Tenthredinidæ, Cynipidæ, Braconidæ, and Chrysididæ (10 pp.), Rev. E. Bloomfield. Entomophaga (2 pp.), Mr. Claude Morley. Hymenoptera Aculeata (6 pp.), Mr. E. Saunders. Coleoptera (28 pp.), Rev. Canon Fowler. Lepi-

doptera (Butterflies), 6 pp., Mr. H. Goss. Lepidoptera (Moths), 40 pp., Mr. W. H. B. Fletcher. Diptera (16 pp.), Mr. J. H. A. Jenner. Hemiptera (12 pp.), Mr. E. A. Butler.

CAPTURES AND FIELD REPORTS.

Notes on Irish Lepidoptera. — In looking over my Westmeath collection of Lepidoptera, and comparing them with Mr. Kane's Irish list, it struck me that the following captures might be worth recording. They are all from the neighbourhood of Mullingar:—*Dasychira fascelina.* One freshly-emerged specimen at rest on heather, July, 1903. I have several times found the remains of the ichneumoned larvæ attached to the heather-tops. Mr. Kane gives two localities for this species, both in King's County.—*Acronycta leporina.* Larvæ not uncommon on alder. —*Tæniocampa opima.* Two at sallow-bloom.—*Hadena protea.* I have a single specimen from a pupa obtained at Clonlost. Only two previous records, *viz.* one from Co. Galway, and one, Kilynin, Westmeath.—*H. glauca.* One bred from a larva taken on heather. — *Apamea ophiogramma.* Does not appear to be common. I took nine specimens one evening. — *Amphidasys strataria.* One only from a pupa. — B. L. Middleton; Mullingar, Ireland.

Lepidoptera in Hertfordshire in 1905.—At a meeting in connection with the Hertfordshire Natural History Society, held at the County Museum, St. Albans, on March 6th, Mr. A. E. Gibbs, F.L.S., Recorder of Insecta for the Society, read his annual report on the Lepidoptera observed in the county during the past year. He said there were only two species to be added to the Hertfordshire list; they were *Senta maritima*, taken at Tring by Mr. A. T. Goodson, and *Xylophasia scolopacina*, recorded from Hitchin by Mr. A. H. Foster. Miss Alice Dickinson, of New Farm, St. Albans, was the only observer who reported the presence of *Colias edusa*, which apparently had not been very plentiful in the British Isles during 1905. *Cyaniris* (*Lycæna*) *argiolus* had also been conspicuous by its absence from its usual Hertfordshire haunts. Miss Dickinson reported the presence of var. *cæruleopuncta* of *Chrysophanus* (*Polyommatus*) *phlæas*, which Mr. Gibbs thought was not so frequently met with in the county as formerly. The presence of *Acherontia atropos* at St. Albans and Baldock was noted, the specimen from the latter place having been picked up in the middle of the North Road, and taken to Mr. Foster. For the second time Miss Dickinson caught a *Cossus ligniperda* at sugar, and Mr. Gibbs remarked that he had also taken it in the same way. Other insects reported by Miss Dickinson were *Notodonta camelina* (beaten from hazel), *Bryophila perla* (at sugar), *Acronycta tridens* (larva), *Neuria reticulata*, *Dianthœcia cucubali*, *Cucullia umbratica*, *Plusia moneta*, *P. chrysitis* and *P. pulchrina*, *Ennomos erosaria*, *Hemerophila abruptaria*, *Anticlea nigrofasciaria*, and *Pelurga comitata*. Mr. Foster, of The Grange, Hitchin, sent in an interesting report, in which he mentioned the capture of three specimens of *Geometra papilionaria* at light; *Eupithecia scabiosata*, in abundance on Pegsdon Hills; *Melanthia albi-*

cillata, in Mr. Grellit's garden; *Anticlea cucullata*, of which only two specimens were taken; *Coremia quadrifasciaria*, five examples at rest; *Cymatophora octogesima*, six at sugar; *Notodonta dictea* and *Apamea unanimis*, at light; *Agrotis ravida*, nine at sugar; and *Cirrhœdia xerampelina*, comparatively common on street-lamps late at night. Mr. Foster also added eight or nine other insects to the Hitchin list. Mr. P. J. Barraud, of Bushey Heath, reported that the season on the whole had been a good one for Lepidoptera. About the usual number came to light at his window, five species being new to his list, viz. *Dianthœcia cucubali*, *Eupithecia pumilata*, *Scoparia ambigualis*, *Yponomeuta padellus*, and *Harpipteryx xylostella*, making three hundred and six species taken at light in that one locality. Sugaring, which had been of little use during the previous few years, was reported by Mr. Barraud to be attractive during August and September. By the removal of Mr. Arthur Cottam from Watford, Mr. Gibbs said the Society lost one of their most careful observers. Before leaving the county he sent a short note recording the capture on June 3rd, at Aldbury, of a specimen of *Chærocampa porcellus*, a species which he subsequently took in his garden at Watford, flying over honeysuckle. A list of captures at Watford was communicated by Mr. V. P. Kitchin, of The Grange, other records being supplied by Mr. W. C. Boyd, of Waltham Cross, Mr. G. B. Digby, of Bournemouth, and Mr. A. T. Goodson, of Tring, the latter gentleman remarking that butterflies were scarcer, not more than a dozen specimens of *Nemeobius lucina* being seen, none of which were taken; while *Gonepteryx rhamni* was also far from plentiful. Among local insects mentioned by Mr. Goodson were *Notodonta dictæoides* (larvæ), *Cymatophora octogesima*, *Plusia moneta*, and *Spilodes palealis*. Mr. Gibbs said he feared his own local observations in 1905 were hardly worth putting on record. The larvæ of *Plusia moneta* were again plentiful in his garden on both aconite and delphinium. Neither sugar nor light yielded anything very remarkable, and very few moths visited ivy-blossom in the autumn, a cold October probably being the cause.—A. E. Gibbs; Kitchener's Meads, St. Albans.

Hertfordshire Coleoptera.—Four species of Coleoptera have been added to the Hertfordshire list. They are *Stenus opticus*, taken in dead rushes near Tring; *Podabrus alpinus*, taken at St. Albans by Mr. A. E. Gibbs; *Longitarsus curtus*, taken at Tring in 1904; and *Apion schönherri*, found in haystack-refuse at Tring. Mr. E. George Elliman, who announced these additions in a short paper which was read at a meeting of the Hertfordshire Natural History Society on the 6th March, pointed out that *Longitarsus curtus* had lately been introduced as British by Mr. J. R. le B. Tomlin on specimens found in the Isle of Man. It now appears that these Manx specimens are a small form of *L. melanocephalus*, Deg. Mr. Elliman had submitted the specimens taken by himself to M. Bedel, and he was quite positive as to their identity. The species has been found on *Echium vulgare* in France, but Mr. Elliman believed that in the case of his own specimens they had been living on a species of *Myosotis*. *L. curtus* bears a considerable resemblance to *L. lycopi*, Foudr.—A. E. Gibbs; Kitchener's Meads, St. Albans.

SOCIETIES.

Entomological Society of London.—*Wednesday, March 7th*, 1906. —Mr. F. Merrifield, President, in the chair.—The Rev. George Wheeler, M.A., of Les Tourelles, Territet, Switzerland, was elected a Fellow of the Society.—The decease of the following Fellows was announced:—Mr. W. P. Blackburne-Maze, Mr. C. W. Dale, and Mr. F. J. Horniman, F.L.S., F.Z.S., &c.—Mr. H. W. Andrews exhibited two specimens of *Microdon latifrons*, Lw., a rare dipteron taken in the New Forest in June, 1905.—Mr. H. M. Edelsten showed examples of *Nonagria neurica*, Hb., and *N. dissoluta* var. *arundineta*, Schmidt, from Germany, with (?) var. *arundineata* from Central Asia, for comparison with *N. dissoluta* and *N. arundineta*, from Kent, Cambridge, and Norfolk.—Mr. L. B. Prout exhibited, and read a note on, a variable series of *Gynopteryx gladiaria*, Guen., and its varieties.—Mr. A. J. Chitty, combs of the honey-bee formed on a branch of nut-tree, the bees having swarmed late in the year. After July they deserted the combs, and having consumed all the honey contained in them, again swarmed on a neighbouring tree.—Prof. R. Meldola, F.R.S., on behalf of Major R. B. Robertson, a specimen of *Prodenia littoralis*, Boisd., which had emerged in a breeding-cage kept, with many others, by Major Robertson, at Boscombe, Hants, for the reception of caterpillars found in that district. The moth emerged on July 16th, 1905. The species, which is figured in Hampson's 'Moths of India,' is said to have a distribution extending from the Mediterranean subregion throughout the tropical and subtropical zones of the Old World.—Commander J. J. Walker said he had taken the larva, known as the Egyptian cotton-worm, in the Central Pacific Islands, feeding on the tobacco-plant.—Mr. O. E. Janson exhibited a *Mantis* on a portion of the bark of a tree as found by Mr. F. Birch in Trinidad, who stated that its close resemblance to a withered leaf was evidently a protection for aggressive purposes.—Mr. M. Burr, a series of *Callimenidæ*; a small family of Orthoptera, consisting of two genera, *Dinarchus*, with the single species *D. dasypus*, Illig., and *Callimenus*, of which all the known species were included, with the exception of *C. inflatus*, Br., from Asia Minor.—Mr. H. Rowland-Brown, specimens of *Argynnis niobe* var. *eris*, female, from the Pyrenees, Cevennes, and South Tyrolese mountains. He drew attention to the remarkable form of the example taken at Gavarnie, in July, 1905, of which the coloration of the upper side of all the wings was ruddy copper-red shot with blue upon the nervures. He also remarked that whereas specimens of *eris* and other Argynnids from the mountainous regions of Central France show a tendency to maintain constant pale forms, those from the Pyrenees are generally more deeply coloured, while the high Alpine forms of Central Europe inclined to melanism.—Prof. E. B. Poulton, F.R.S., an original note-book of Burchell's taken to South Africa in 1812. He said that it established the date of the author's birthday, hitherto unknown, to be July 12th, while it also recorded for the first time the superstitious dread of the native Hottentots for the "Death's-head Moth," known locally as the "Devil Bee."—Dr. F. A. Dixey, specimens of Pierine butterflies from South Africa, India, and Asia Minor, to illustrate how the under sides of the dry-season forms in the group are apt to take a

cillata, in Mr. Grellit's garden; [illegible] to note that the same ten-specimens were taken; *Coremia* [illegible] from such widely separate *Cymatophora octogesima*, six at [illegible]municated a note on the *unanimis*, at light; *Agrotis* [illegible], extracted from a report *xerampelina*, comparatively comm[illegible] Tanaar—*Avicula* (*meleagrina*) Mr. Foster also added eight or [illegible] F.L.S., F.Z.S., &c., in the Mr. P. J. Barraud, of Bushey H[illegible]ence.' A discussion followed, whole had been a good one for [illegible] G. C. Champion, and other came to light at his window, fi[illegible] read a note on "A Plague of *Dianthœcia cucubali*, *Eupithecia* [illegible] Town, South Africa," and *meuta padellus*, and *Harpipteryx* [illegible] the insects referred to by him. six species taken at light in th[illegible] "On some Rest Attitudes in been of little use during the p[illegible] specimens arranged upon back-Barraud to be attractive during [illegible] approximating to the natural of Mr. Arthur Cottam from W[illegible] various habitats. A discussion one of their most careful obs[illegible] Poulton, Dr. Chapman, Mr. H. a short note recording the ca[illegible]d.—Dr. T. A. Chapman read men of *Chærocampa porcellus*, [illegible] Life-history of *Trichoptilus* his garden at Watford, flying [illegible] F.R.S., read a paper by Mr. Watford was communicated [illegible] Hymenopterous Insects of North other records being suppli[illegible] of interesting specimens to Mr. G. B. Digby, of Bourn[illegible] Brown, M.A., *Hon. Sec.*

the latter gentleman remark[illegible] Natural History Society.— than a dozen specimens of [illegible] President, in the chair.—Mr. Kaye were taken; while *Gonep*[illegible] *ayittata*, and called attention to Among local insects menti[illegible] the *Thalictrum* flowers, and to *oides* (larvæ), *Cymatoph*[illegible] *palealis*. Mr. Gibbs said [illegible] Simmons.—Mr. R. Adkin, cases of were hardly worth putti[illegible] *rillusella*, and pointed out the were again plentiful in [illegible] of the evening was taken up by Neither sugar nor light y[illegible] of lantern slides:—Mr. West, of moths visited ivy-bloss[illegible] Texas, rare plants, life-histories of being the cause.—A. E. [illegible] and Mr. Tonge, microphotographs [illegible] butterfly found in Great Britain.

Hertfordshire Col[illegible] in the chair.—Mr. Handisyde, of added to the Hertfordsh[illegible]—Mr. Edwards exhibited a specimen rushes near Tring; *P*[illegible] closely related to *P. eurimedes*, from Gibbs; *Longitarsus cu*[illegible] and Main, *Oporabia dilutata*, from *herri*, found in haystack[illegible] and the New Forest, and pointed out announced these addi[illegible] found in the three areas; and he also of the Hertfordshire N[illegible] from Enniskillen.—Mr. H. Moore, out that *Longitarsus* [illegible] all others from the island of Trinidad.— Mr. J. R. le B. Tomli[illegible] of *Pachina postremana* and *Ephippiphora* appears that these [illegible] *cephalus*, Deg. Mr. [illegible] cleaned by several applications himself to M. Bedel[illegible] extremely greasy at first.—Mr. Goulton, The species has bee[illegible] black form of *Acronycta leporina*; a gynan-man believed that [illegible] from Manor Park (bred); *Tephrosia* living on a specie[illegible] and second brood bred from the New semblance to *L. l*[illegible] bred from oak, which seemed to partake of the St. Albans. [illegible] and *D. cultraria* (*unguicula*).— [illegible] specimen of *Anthocharis genutia* from New [illegible] of *Colias philodice*, female, from different [illegible] Mr. Kaye read a paper on mimicry, with especial

reference to a few groups of South American butterflies, and exhibited a large number of insects in illustration. — HENRY J. TURNER, *Hon. Report Secretary.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY. — *February 19th*, 1906. — Annual Meeting.—Mr. G. T. Bethune-Baker, President, in the chair. —The various annual reports, statement of accounts, &c., were presented, and the Officers and Council elected for the ensuing year.—Mr. H. Willoughby Ellis exhibited various Coleoptera, including *Mycetochares bipustulatus*, the larva of which was taken in the New Forest, May 30th, 1904, and pupated on June 1st, and the imago emerged on June 10th, 1904; also *Ptinus sexpunctatus* from Solihull, an insect new to Warwickshire; also an *Opilo*, bred from the galls of *Cynips kollari* found at Biskra by Mr. W. H. Wilkinson. It differs so slightly from our British *mollis* that it is probably that species; also a drawer of *Anchomenus*, comprising all the species of the British list. Mr. W. E. Collinge, a small moth from the Fiji Islands, where it has been doing serious damage to the cocoa-nut palms, together with the larvæ and pupæ, and cocoons of the same. He said that so serious was the damage, that in one large wood all the leaves hung down as if dead; unfortunately he could not yet give its name.—Mr. G. H. Kenrick showed various butterflies, including some fine Danaidæ, Acræinæ, &c., from New Guinea, Thursday Island, the Loyalty Islands, &c.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 7th.*—Mr. Henry A. King, of "Oakleigh," Coolhurst Road, Crouch End, was elected a member of the Society.—Exhibits:—Mr. A. Bacot, preserved larvæ of *Lasiocampa quercus* and subspecies *callunæ*, *meridianalis*, *spartii*, and *sicula*; also examples of hybrid larvæ, *spartii* × *meridianalis*, *spartii* × *callunæ*, *callunæ* × *meridianalis*, and *sicula* × (*spartii* × *meridianalis*).—Rev. C. R. N. Burrows, preserved larvæ representing over two hundred species, including *Aporia crataegi*, *Eremobia ochroleuca*, *Phlogophora empyrea*, and *Cucullia absinthii*. —Mr. A. W. Mera, preserved larvæ of *Amphidasys betularia* from one brood, those fed on birch being brown, and those on sallow, green.—Messrs. Sequeira, Shaw, and Clark also exhibited preserved larvæ, *Triphæna subsequa* being among those shown by the latter.

February 21st.—Rev. C. R. N. Burrows exhibited *Nonagria neurica* from Mucking, Cambridge, and East Kent; and one example of ab. *hessii* from Rainham.—Mr. H. M. Edelsten, *N. neurica* (Hb.), and *N. dissoluta* (Tr.) var. *arundineta* (Schmidt), received from Herr Pungeler, of Aachen; also *N. neurica* and ab. *hessii*, from various English localities, with ova, larvæ and pupæ.—Mr. F. Capel Hanbury, *Leucania brevilinea*, including a specimen closely approaching var. *belinea*.—Mr. W. J. Kaye, bred *Zonosoma pendularia* from Reading, showing a strong central pink band, and var. *subroseata* from Staffordshire.—Mr. A. Harrison, *Oporabia dilutata* from the New Forest, the pale form commonly distributed over the country; from Epping, generally darker and with little or no trace of the band on fore wings; and from Delamere Forest still darker, but with the bands distinctly marked.—Mr. A. W. Mera, *N. neurica* from Cambridge and Mucking, and Mr. L. B. Prout, ab. *hessii*, from East Kent.—Mr. H. M. Edelsten read a

paper entitled "The Identity of the British *Nonagria neurica*," which he showed that Hübner figured two different species under th name, and proved that the insect at present known in Britain *N. neurica* is really var. *arundineta* (Schmidt) of *Nonagria dissolu* (Treitschke) (=*neurica*, Hübner, figs. 659-61, non 381, *hessii*, Bdv and that the form regarded as ab. *hessii* is the type of *N. dissoluta* (T S. T. Bell, *Hon. Sec.*

Lancashire and Cheshire Entomological Society. — The usu monthly meeting of this Society was held in the Royal Institutic Liverpool, on March 19th.—Mr. R. Wilding, Vice-President, occupi the chair.—A paper was read by Mr. W. Mansbridge, upon the Mic Lepidoptera of the Liverpool district. About seventy species we dealt with, some of them new to the county list. Among the mo interesting records was that of the moth *Myelois ceratoniæ* and aberration *pryerella*, with an intermediate form; these were bred fr larvæ found in dates purchased in Liverpool. Another interesti insect was a specimen of *Dioryctria abietella*, a very dark form captu in Delamere Forest. A bred series of the local Tortrix, *Peronea perm tana*, from Wallasey, was also referred to by the author, who exhibi most of the species noted in illustration of his paper. Other exhib were a series of *Semasia wœberiana*, bred by Mr. G. L. Cox, from lar found in cherry-bark at Oxton; Mr. E. J. B. Sopp, F.E.S., the exc cockroaches *Nyctibora holosericea* and *Panchlora virescens*, from ship-canal docks at Manchester.—H. L. Sweeting & Wm. Mansbrid *Hon. Secs.*

RECENT LITERATURE.

The Lepidoptera of the British Islands. Vol. X. By Charles G. Barrett. Pp. 381. London: Lovell Reeve & Co. 1905.

Almost up to the day of his much lamented death, the author h been engaged upon the present volume, nearly half of which had th been published, in monthly parts, or was in the press. The remain of the MS. continuing the work up to the end of the Tortricina found to be practically ready for publication, and, although the pa were not numbered throughout, this had been done sufficiently fa give a clue to what his intentions had been with regard to final arran ment. It was decided therefore to continue publication of the work the end of the Group, and to adhere as closely as possible to the or in which the papers were found to be set out. The present volu deals with the Pyralidina—Phycitidæ, Anerastiidæ, Crambidæ, Galleriidæ; and Tortricina—Tortricidæ, Cnephasidæ, Lozoperidæ, Sericoridæ.

The British Tortricina are an exceedingly interesting group, co prising a large number of species. Many of these are to be obtained co monly when once their habits are understood. We believe that it been solely owing to the absence of a guide such as this work will pr to be that the group has been so long neglected, but we are sangu enough to believe that the time is not far distant when a more ac and widespread interest will be taken in our Tortrices.

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A MELANIC FORM OF *ACRONYCTA LEPORINA*.

By Alfred J. Willsdon.

The melanic specimen of *A. leporina*, represented by the central figure, was bred last June from an Essex larva.

The fore wings of the insect are glossy black, with white fringes. The black markings of the typical insect are for the most part discernible, and they are partly relieved by a faint white edging. The hind wings are somewhat suffused towards the inner and outer margins, and the nervures are strong and dark. The thorax is quite black, and the abdomen decidedly dark.

The lower insect figured represents normal Essex specimens,

and, so far as I am aware, no intermediate forms have been taken in this district such as those recently referred to in the 'Entomologist' (xxxviii. 289) from the Liverpool district.

The upper figure is of a New Forest specimen for comparison.

I am indebted to Mr. E. C. Goulton for the excellent photograph here reproduced.

DESCRIPTIONS OF TWO NEW SPECIES OF ICHNEUMONIDÆ FROM JAPAN.

By P. Cameron.

Anomalon japonicum, sp. nov.

Black; flagellum of antennæ dark rufous, thickly covered with short, stiff black hair, the scape with longer black hair; the inner eye orbits narrowly to the top of the antennæ; a broader, shorter mark in the centre of the face, slightly dilated towards the apex, where it is bluntly triangular. Base of clypeus broadly in the middle, labrum and the outer orbits narrowly, yellowish fulvous; the base of abdomen widely red; the petiole black in the middle above and in front of the post-petiole, the second segment being also black above. Legs fulvous, all the coxæ, the apices of the hinder femora, and tarsi, black. Wings fulvo-hyaline, the stigma rufo-testaceous, the nervures fuscous, the tegulæ ferruginous. Scutellum yellow. Female. Length 23 mm.

Shirakawa, Japan. (George Lewis).

Head rugosely punctured, thickly covered with long black to fuscous hair, the inner orbits much more closely and finely than the face or front, which is depressed and distinctly furrowed in the middle; the clypeus has the punctures larger and more distinct than they are on the front; its apex is smooth. Mesonotum thickly covered with fuscous hair, coarsely punctured, its middle lobe slightly raised; a shallow furrow in the centre. Scutellum coarsely punctured, thickly covered with long fuscous hair, its base depressed in the middle; the apex black, depressed, the depression keeled laterally; sides of post-scutellum sharply keeled. Median segment coarsely reticulated, the apex depressed, coarsely transversely striated. Pro- and mesopleuræ closely, rather strongly punctured, the apex of the former widely and deeply depressed; the base of the metapleuræ in the middle coarsely rugose, the rest rugosely reticulated.

This species may be known from *A. flavifrons*, Sm., by the smaller size of the latter, by its four anterior coxæ and trochanters being bright yellow, by the face, mandibles, and antennal scape being yellow in front (the sculpture of *flavifrons* is not stated). *A. insidiator* is larger (35 mm.), has the basal two segments of the abdomen black, and the fore coxæ are not black.

Campoplex japonicus.

Black; the third, fourth, and the basal half of the fifth abdominal segments rufous. Wings hyaline, the stigma and nervures black, the areolet triangular, appendiculate above, the pedicle being not much shorter than the branch of the first transverse cubital nervure; the recurrent nervure is received in the basal third of the areolet; the anterior femora and tibiæ testaceous in front. Female. Length 12 mm.

Kobe, Japan. July (George Lewis).

Front and vertex closely, the face and clypeus more closely but not so strongly, punctured; they are thickly covered with long, fuscous hair. Mesonotum closely and uniformly punctured, and thickly covered with short, fuscous pubescence. Scutellum closely, rugosely punctured, sparsely covered with pale hair; the post-scutellum is, if anything, more strongly rugose; the apical slope of the scutellum is longer and more obliquely sloped than the basal. Median segment closely, irregularly transversely striated, the middle at the base more weakly; at the apex the striation is coarser. Pleuræ coarsely closely punctured; the mesopleuræ at the top and in front of the coxæ striated; the punctuations on the metapleuræ above the keel run into striations. Abdomen thickly covered with white pubescence, smooth. Sheaths of ovipositor black, dilated towards the apex, covered with white hair.

NOTES ON THE HYMENOPTEROUS FAMILY MICROGASTERIDÆ.

By Claude Morley, F.E.S., &c.

No more introduction to this ubiquitous family is necessary than to say that it is constituted of those nasty little black "flies," which are all too often bred by lepidopterists, more especially from such hosts as *Abraxas grossulariata* and *Pieris brassicæ*; everyone knows *Apanteles glomeratus* and *Microgaster globatus* by sight, if not by name. My object in publishing these notes is, however, to draw attention to hymenopterous parasites in general, and to point out that their economy is far less perfectly known (and consequently more worthy of study) than is that of their hosts and victims. I shall at all times be very grateful to lepidopterists who will send me their unwillingly bred parasites, and will do the utmost in my power to name such as may appear of interest to the breeder. The Microgasteridæ does not belong to the Ichneumonidæ, but to the Braconidæ; and it is to Marshall's 'Braconides d'Europe' that I owe the identification of the following species, which have at various times been most kindly sent to me by Rev. C. D. Ash, Eustace Bankes, E. C. Bedwell, G. C. Bignell, Dr. Capron, Dr. Chapman, Miss E. Chawner, H. J. Charbonnier, W. G. Clutten, Dr. R. T. Cassal,

W. G. Cross, A. A. Dalglish, W. Evans, E. Goodwin, Selwyn Image, G. W. Kirkaldy, A. M. Montgomery, G. Nicholson, H. Parkes, F. H. Peachell, Albert Piffard, E. W. Platten, Hon. N. C. Rothschild, R. M. Prideaux, Mrs. Redmayne, A. Sich, W. H. Tuck, F. J. Whittle, J. Wigin, and T. C. Woodforde. There are two small genera, each with a single British species (*Mirax spartii* and *Acoelius subfasciatus*), of which I know nothing. The remainder of the family consists of three somewhat extensive genera, of which the first comprises ninety-one species, of which seventy-three are (now) British; of these I find I possess thirty-seven :—

APANTELES, Först.

1. *salebrosus*, Marsh.—Nine imagines and sixteen cocoons ex *Selenia* sp., 1903, probably from Kent (Goodwin).—One and one cocoon, bred from a coleopteron [Marshall thought the records of all hosts, other than Lepidoptera, erroneous in this genus] at Ely, August, 1901 (Cross).—Seventeen and six cocoons ex larvæ of *Eupithecia helveticata*, Milngavie, January, 1899 (Dalglish).—Only previously known from Scotland, in the female sex. The male differs only in sexual features.

2. *tetricus*, Reinh.—I captured a single specimen on flower of *Heracleum sphondylium* at Lyndhurst, in August, 1901.

3. *congestus*, Nees. — Seventeen imagines and ten cocoons ex larva of *Arctia fasciata*, from Cannes; emerged April 25th–May 5th, 1901 (Chapman).

4. *ferrugineus*, Reinh.—Swept from sallow at Barton Mills and Tuddenham Fen, Suffolk, June, 1901. Said to be a social parasite of *Chilo phragmitellus*, which has been recorded from the latter locality.

5. *limbatus*, Marsh.—I possess a single example, taken in the Ipswich district in 1893.

6. *glomeratus*, Linn. — Felden, in Herts (Piffard).—Sixteen and seven cocoons ex one larva of *Abraxas grossulariata*, bred June, 1899 (Peachell).—Six and a bundle of cocoons ex *Pieris rapæ*, Burnley, in October, 1899; emerged June, 1900 (Clutten). —Two and cocoons, with *A. callidus*, ex Geometrides, Dartmouth, autumn, 1900 (Bankes).—I dug up four cocoons near Ipswich, at the base of an elm, in December, 1898, which produced what I believe to be this species, on the 1st of the following July.

7. *vanessæ*, Reinh.—Two and a bundle of cocoons ex *Hadena oleracea* at Ely, in October, 1900 (Cross).—The species is new to Britain, being recorded by Marshall only from Vienna and Germany; it differs from *A. glomeratus* in having the mesopleuræ densely punctate almost throughout. It had previously been bred only from *Vanessæ*, *Argynnes*, and *Limenitis sibylla*.

8. *spurius*, Wesm. — Felden, in Herts (Piffard). — Six and bundle of cocoons ex *Agrotis præcox*, bred June 26th, 1883 (Big-

nell).—Three and cocoons, with two hyperparasitic *Pezomachus intermedius*, Först., from Publow, Somerset, in September [host not specified] (Charbonnier).—Eight and cocoons, Ipswich, early in June (Platten). — Six dug at base of tree, Wednesbury, in November, 1900 (Parkes). — Five and cocoons from Francochamps, Belgium, at 2000 ft., January, 1901 (Kirkaldy).

9. *cleoceridis*, Marsh. — Eight and a bundle of cocoons ex larva of *Tethea subtusa* from Bishop's Wood, Selby, Yorks, in June (Ash). The cocoons are almost white, and enclosed in a common envelope, as in the last species.

10. *geryonis*, Marsh. — Four and seven cocoons ex *C. rhododactylus*, England, July, 1899. I captured a specimen in the Bentley Woods, near Ipswich, at the end of May, 1900.

11. *zygænarum*, Marsh.—Three from cocoons of *Zygæna filipendulæ*, Bristol district (Charbonnier).—Eight and nine cocoons ex live larva of *Z. filipendulæ*, Surrey, June (Prideaux).— Twelve and two bundles of cocoons ex *Z. filipendulæ* at Southend in July (Whittle). — Felixstowe, ex *Z. filipendulæ*, in July (Platten).— I have beaten it from oak at Brandon, in Suffolk, early in June.

12. *caiæ*, Bouché.—Ten ex *Chelonia caja*, Ipswich, May, 1899 (Platten).—Eight and thirteen cocoons ex *Arctia ? caja* larva, Epping, 1901 (Image).—A common parasite of tiger moths.

13. *juniperatæ*, Bouché.— One and one cocoon ex larva of *Eupithecia castigata* at the time of spinning up, Newcastle, in May (Nicholson).—One ex larva of *Amphydasis betularia*, in garden at Methley, near Leeds (Wigin).

14. *placidus*, Hal.—Five and one cocoon ex *Abrostola urticæ*, at Ely (Cross). Received October 18th, 1900; emerged April 9th, 1901. This species has not before been bred, and its cocoons, which are solitary, nearly white, and attached to a leaf, were unknown.

15. *nothus*, Marsh. Five and cocoons ex *Anticlea sinuata*, Tuddenham, Suffolk; bred May and June, 1899 (Rothschild).

16. *difficilis*, Nees. — Twenty-three and thirteen cocoons ex larva of *Amphydasis betularia*, from garden, Methley, Leeds (Wigin). Received October, 1899; emerged May 4th to June 18th, 1900.—Eleven and nine cocoons ex larva of *Xylocampa lithorhiza*, Suffolk, 1898 (Tuck).—Four and four cocoons ex moribund larva of *Notodonta ziczac*, Haslemere (Prideaux). Taken September 26th, 1899; emerged May 11th, 1900.

17. *falcatus*, Nees.—Both sexes at Felden, in Herts (Piffard). —I have taken it on flowers of *Angelica sylvestris* at Barnby Broad, in Suffolk, in August.

18. *cultrator*, Marsh.—Eleven imagines and a lot of cocoons ex *Melitæa athalia*, at Locarno (Chapman); received May, 1900. This species has not before been bred from a determined host.

19. *ultor*, Reinh.—One and five cocoons of this rare species

were bred from a moribund larva of *Notodonta ziczac*, at Haslemere, Surrey, in September, 1899 (Prideaux).

20. *decorus*, Hal.—I have taken the female flying in Bentley Woods, near Ipswich, early in May; and Tuck has captured the same sex at Benacre Broad, Suffolk, in late August.

21. *xanthostigmus*, Hal.—Felden, in Herts (Piffard).

22. *prætor*, Marsh.—Two at Shiere, in Surrey (Capron).

23. *obscurus*, Nees.—Oulton Broad, Suffolk, September, 1900 (Bedwell).—Felden, in Herts (Piffard).—I have taken it on flowers of *Angelica* at Lymington and *Heracleum* at Lyndhurst in August, and beaten it from oaks at Brandon, in Suffolk, in early June.

24. *tenebrosus*, Wesm.—One and one cocoon ex *Pterophorus pterodactylus*, June, 1899 (Chapman).—Three ex *Rumia cratægata*, Methley, Leeds (Wigin); received October, 1901.—Three, received at the same time, ex *Amphydasis betularia*.—Three and four cocoons, November, 1899, ex *Liparis auriflua*, Reigate (Prideaux). Not before recorded from Britain.

25. *impurus*, Nees.—One ex *L. paucillmana*, bred at Cannes in May, 1901 (Chapman).

26. *coniferæ*, Hal.—One in Walberswick salt-marshes, Suffolk, August, 1898.

27. *lineipes*, Wesm.—Dr. Chapman has bred six specimens, which I think must be referable to this species, whose hosts were previously unknown, from eight cocoons ex *Melitæa athalia*, at Cannes or Lacarno, in April, 1900.

28. *fuliginosus*, Wesm.—I have found this species at Claydon, in Suffolk, on *Angelica* flowers, in August, and swept it in Roydon Fen, in Norfolk, in June.—One and one cocoon ex *Sesia fuciformis*, Wateringbury, Kent, July, 1903 (Goodwin).—Two and eight cocoons ex larvæ of *Platyptilia acanthodactyla*, Dartmouth, September, 1904 (Bankes).—Five and six cocoons ex larva of *Spilothyrus alceæ*, Cannes, May, 1901 (Chapman).

29. *octonarius*, Ratz.—Three and bundle of cocoons ex live larva of *Pericallia syringaria*, Surrey, June, 1899 (Prideaux).—One and bundle of cocoons ex *P. syringaria* (Sich).—Sixteen and cocoons, New Forest, June, 1902 (Cross).

30. *astrarches*, Marsh.—I have captured this species by sweeping hedge-bottoms at Lakenheath and Bentley Woods, in Suffolk, in May and June.

31. *fraternus*, Reinh.—Shiere, in Surrey (Capron).—One ex larva of *Buccalatrix cristatella*, bred at Chiswick, early in June, 1901 (Sich).—I have swept it at Ealing in June.

32. *triangulator*, Wesm.—Felden, in Herts (Piffard).—One ex *Coleophora gryphipennella*, Chiswick, June, 1901 (Sich).

33. *pallidipes*, Reinh.—A common parasite of *Plusiæ*.—Three and eight cocoons ex *P. orichalcia*, Ely, 1903 (Cross).

34. *bicolor*, Nees.—I have swept it in the Southwold salt-

marshes in August. — One ex *Psyche opacella*, in June, 1899 (Chapman).

35. *callidus*, Hal. — Felden (Piffard). — Shiere (Capron).—Twelve and cocoons, with two *A. glomeratus* (above), ex larvæ of Geometrides, Dartmouth, autumn, 1900 (Bankes).

36. *lateralis*, Hal.—Taken by Capron at Shiere, and Pifford at Felden, in Herts.

37. *fulvipes*, Hal. — A common species on the wing ; I have taken it in Suffolk—at Wortham, Tuddenham Fen, Barton Mills, and Stanstead Wood—in June.—Six and bundle of cocoons ex *Noctua xanthographa* (Bignell).—Four and five cocoons ex *Epione vespertaria*, York district, July, 1900 (Ash).

The next genus contains nineteen European species, of which thirteen are now known to be indigenous to Britain. I have seen but seven of these :—

MICROPLITIS, Först.

1. *spinolæ*, Nees.—This I swept in the Southwold salt-marshes on August 1st, 1904.

2. *tristis*, Nees.—Forty specimens bred in August, 1900, from larvæ of *Dianthœcia capsincola*, Eastbourne (Montgomery).—Thirty-two bred from *D. cucubali*, in Suffolk, autumn, 1898 (Tuck).

3. *dolens*, Marsh.—One on *Angelica sylvestris* flower at Claydon, Suffolk, August 12th, 1899.

4. *spectabilis*, Hal.—A common species on the wing; bred from *Dianthœcia capsincola*. On April 3rd, 1893, seven specimens emerged from the chrysalids of *Apamea unanimis*, whose larvæ I took at Ipswich during the preceding February.

5. *mediana*, Ruthe.—Captured at Felden, in Herts (Piffard), and on flower of *Angelica sylvestris* at Claydon, in Suffolk, late in September, 1898.

6. *tuberculifera*, Wesm.—Felden, in Herts (Piffard).—Ipswich and Diss, in June ; swept at dusk in Bentley Woods in September, 1897 (C. M.).—Three bred from *Dianthœcia irregularis* in Suffolk, September, 1899 (Tuck).—Bred from *Chesias obliquaria*, at Ely, October, 1900 (Cross).—Bred from larva of *C. obliquaria*, December 7th, 1901 ; four or five of these larvæ were infested, the parasite in each case emerging from the tenth segment, when the host was three-quarters grown; Market Drayton, Salop (Woodforde).

7. *sordipes*, Nees. — New Forest, bred, November 28th, 1900 (Chawner). — Bred at Ely from *Acronycta psi*, in October, 1900 (Cross).—This species has not before been recorded from Britain.

The last genus of this family is comprised of twenty-eight species in Europe, of which twenty-one are British. I can, however, mention but ten of these, including that brought

forward by me as new (*cf.* E.M.M. 1902, p. 4), which had previously been known only from Suffolk.

MICROGASTER, Latr.

1. *alvearius*, Fabr. — Eight specimens bred from *Boarmia repandata*, in Devon (Bignell).—I have found their characteristic cocoons, over which the moribund larva seems to "brood," at Ipswich (*cf.* Entom. 1880, p. 244).

2. *calceatus*, Hal. Bred at Reigate, from *Fidonia piniaria*, in September, 1899 (Prideaux).

3. *connexus*, Nees.—Reared in plenty from two cocoons of *Liparis auriflua*, at Lichfield, in August, 1900 (Mrs. Redmayne). —Nine from the same host in the Bristol district (Charbonnier). —Five ex *Bombyx neustria*, at Bungay, Suffolk, in August (Clutten).—Six from *L. auriflua*, in November, 1899 (Prideaux); probably at Reigate Surrey.

4. *tiro*, Reinh.—I have captured it by sweeping reeds at Henstead, Suffolk, August, 1898. Its hosts have been hitherto unknown, but Dr. Chapman bred one on June 29th, 1899, from a species of *Cnephasia* at Reigate; the cocoon is dull, white, solitary, and nearly smooth.

5. *suffolciensis*, Morl. — The type (in my collection) is from *Nothris verbascella*, at Bury St. Edmunds. — Two females ex *Nothris verbascella*, at Locarno, May 30th, 1903 (Chapman).— The type is a male (female *in errore*), and the female differs from it only in having the antennæ shorter, and the terebra three-quarters the length of the abdomen. I have seen no cocoon.

6. *rugulosus*, Nees. — Bred from *Hydrocampa nympheata*, at Richmond, October 3rd, 1905; the strong whitish cocoon is found inside the host's aquatic case, attached to one of its walls (Sich).

7. *subcompletus*, Nees. — I have swept it at Eaton, near Norwich, in June; and found it on flowers of *Fœniculum vulgare* at Alderton, Suffolk, in September.

8. *sticticus*, Ruthe.—Tostock, Suffolk, in July (Tuck).—Three from a nearly circular bundle of white cocoons, enclosed in a rolled nettle-leaf, ex *Vanessa atalanta*, Reigate, in July, 1899 (Prideaux).—I have taken it on *Angelica* flowers at Barnby Broad, but it has not before been bred.

9. *globatus*, Linn.—A common species on flowers of *Fœniculum vulgare* and *Angelica sylvestris* from July to October. Bred from *Vanessa atalanta* at Tring, October, 1899 (Rothschild). — Bred from forced *Penthina dimidiana*, Medge Hill, Doncaster, 1901 (Cassal).

10. *tibialis*, Nees.—Very common on flowers of *Anthriscus* and wild carrot. Two bred from Aberdeenshire *Euchromia flammeana*, in June, 1902 (Ash).—Bred from a continental *Depressaria* in 1904 (Chapman).—Gorebridge, N.B., in June (Evans).

The above will, I think, show how much may be done in the elucidation of the life-histories of these obscure parasites by their preservation by breeders of Lepidoptera; no less than forty of the above hosts were previously unknown to be attacked by the parasites here enumerated.

Monks Soham House, Suffolk: April 14th, 1906.

NOTES ON TRICHOPTERA COLLECTED IN SICILY BY DR. T. A. CHAPMAN.

By Kenneth J. Morton, F.E.S.

Some time ago Dr. Chapman kindly handed to me a number of Trichoptera taken by him in Sicily in the spring of 1905. The list of species is not long, but the collection is interesting out of proportion to its size, especially on account of the presence of a species of *Rhyacophila*, which at first I thought to be quite new, but which I am now disposed to regard as a race of the little-known *Rhyacophila rougemonti*.

The existing information as to the Trichoptera of Sicily is, I believe, comparatively old and not extensive, resting mainly on the researches of Zeller, Mann, and Bellier de la Chavignerie. In any case, the species found in the island are probably not numerous, the poverty in aquatic Neuroptera having long ago been pointed out by Blanchard, and properly attributed to the absence of lakes and marshes, and also to the very important fact that the rapid torrents of winter very quickly dry up at the beginning of summer. Thus it is that the characteristic Neuroptera of Sicily and the coast of Calabria are those which are terrestrial—ant-lions, species of *Ascalaphus*, and some Hemerobiids.

The species of Trichoptera found by Dr. Chapman are as follows:—

Stenophylax ——?.—A female of the group containing the large pale species, always difficult to determine in this sex when isolated examples are found. The valves in the present specimen are much retracted, and in the meantime I cannot attempt determination.

Hydropsyche instabilis, Curt. — One female of what I take to be the dark form that McLachlan says is characteristic of the southern parts of Europe (*stictica*, Pictet).

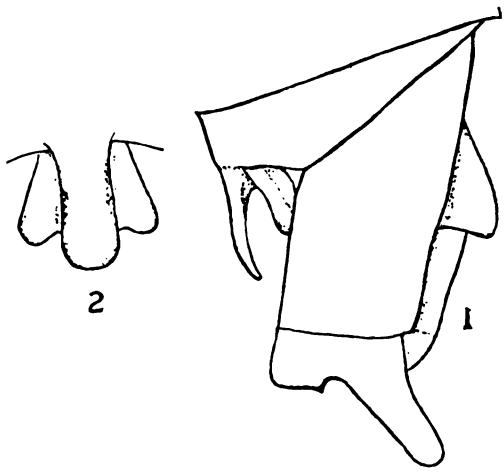
Wormaldia mediana, McL.—A small series of a *Wormaldia* agrees fairly well with the description of this somewhat uncertain species.

Tinodes locuples, McL.—A pair. This species was originally

described from three males taken by Mann in Sicily, now in the Vienna Museum.

Polycentropus flavomaculatus, Pict.—Two males.

Rhyacophila rougemonti, McL., var. *sicula*, nov. var.—In this form the male appendages are very similar to those of the type as figured by McLachlan, although in the single male before me the inner parts cannot be seen clearly. The principal difference



is visible in the lateral view; the second joint of the inferior appendage has its hind margin with a much shallower incision in the Sicilian form.

The discovery of this insect in Sicily throws an important light on the origin of the type. It was given to McLachlan by Professor de Rougemont, and was stated by the latter to have been taken by him at St. Aubin, Neuchâtel. McLachlan was, however, never quite satisfied that this locality was the right one, de Rougemont having also collected in Italy, and this doubt was increased by the discovery of a male very close to the type in Corsica. The species has never to my knowledge been found again north of the Alps, and I am of the belief that de Rougemont made some mistake, and that it will prove to be a purely southern form.

All the examples noticed here were taken at Taormina in the beginning of April.

Fig. 1. Apex of abdomen, from side. Fig. 2. Dorsal process, from above.

13, Blackford Road, Edinburgh: March, 1906.

ALGERIAN BUTTERFLIES IN THE SPRING AND SUMMER OF 1904.

By Margaret E. Fountaine, F.E.S.

(Concluded from p. 89.)

S. fidia var. *albovenosa*, Aust.—This magnificent form of *fidia* occurred at the same time and in the same localities as *hansii*, but was less common, and very shy and difficult to catch. The female was rare.

Pararge egeria, L.—Algerian specimens of this butterfly are a very bright fulvous. It occurs, I might almost say, everywhere throughout the spring and summer. The best I have are from Algiers in February (1902), and from Sebdou in July.

P. megæra, L.—At Biskra in the spring, frequenting the tops of the desert mountains in company with the other butterflies of that district.

Epinephele jurtina var. *fortunata*, Alph.—Common round Teniet in June. Bears a striking resemblance to var. *hispulla*, Hüb.

E. lycaon var. *mauritanica*, Obth.—Not uncommon near Teniet in June, especially in the forest. The females, which were rare, are a dark form, and both sexes have the hind wings beneath a plain even grey, quite unbroken.

E. ida, Esp.—Was practically over at Tlemçen in mid-July. The few females I found worth keeping are very strongly marked on the under side.

E. pasiphaë var. *philippina*, Aust.—Fairly common round Teniet in the end of May. Rather smaller than the type, with the fulvous ground colour more widely extended, also the eye-spots on the lower wings smaller and not ocellated.

Cœnonympha fettigii, Obth.—Very common in the woods of prickly oak on the mountains near Sebdou, end of June and throughout July.

C. pamphilus var. *lyllus*, Boisd.—A remarkably fine form at Sebdou and Tlemçen in July.

Thecla ilicis var. *mauretanica*, Stgr.—First taken at Teniet on June 8th, where it soon became abundant wherever the prickly oak grew. I took one specimen, which resembles the type above, but has the white line as nearly obliterated beneath as in any of the *mauretanica*, though no other Algerian specimen I have the least approaches it on the upper side.

Callophrys rubi var. *fervida*, Stgr.—Near Algiers in March (1902).

Zephyrus quercus var. *iberica*, Stgr.—Swarming in the oak-woods west of Sebdou early in August. Resembles the type above, but has the white line on the under side very faint and indistinct.

Thestor mauritanicus, Luc.—In certain places near Algiers in February (1902). Not common.

T. ballus, F.—Going over in the cedar forest above Blidah in May. Very common at El Kantara and Algiers in February and March (1902).

Chrysophanus phlœas, L.—Occurred in most places throughout the spring and summer.

Cigaritis siphax, Luc.—Scarcely abundant, but fairly common in a few localities near Teniet; but was practically over when I first came across it on May 31st.

Lampides bœticus, L.—At El Kantara in March, and at Sebdou in August.

L. telicanus, Lang.—At Sebdou in August. The specimens were very small.

L. theophrastus, F.—One female only below Teniet in June. Common all round a certain prickly shrub at Sebdou in August. Their preference for this shrub, which the females never seemed to leave at all, made it a somewhat difficult matter to effect a capture otherwise than destructive to the net; however, the males would occasionally make short detours into the open, though invariably returning to the favoured shrub, and the females were so sluggish, even in the middle of the day, that I was able more than once to pick one off with my fingers. This butterfly also occurred, but not at all commonly, at El Kantara in March (1902).

Lycæna martini, Allard. — Common on certain hillsides in the neighbourhood of the Cascade below Teniet. But it was practically over when I first came across it at the end of May, and a male, even in fair condition, was scarcely to be had; but I took a good though short series of females.

L. baton var. *abencerragus*, Pier.—Near El Kantara in March and April; also at Hammam R'Irha in April. Not common, except at El Kantara, in March (1902).

L. astrarche var. *calida*, Bell.—The specimens of this butterfly taken at Tlemçen in July were a deep reddish brown beneath, and certainly belonged to this variety.

L. icarus var. *celina*, Aust.—Most of the males at Sebdou in August, and at Milianah in September, belonged to this variety. I have one from Milianah with a slight inclination to orange spots on the upper side of the hind wings.

L. bellargus var. *punctifera*, Obth.—All the male *bellargus* at Sebdou in July were of this variety; but it was very far from common. I took one in which there were orange spots above the black dots on the upper side of the hind wings, but unluckily the specimen, though fresh, was damaged.

L. lorquinii, H. S.—Was common and quite fresh in the cedar forest at Teniet on May 21st. Unluckily I did not realize the importance of it, so failed to secure a good series, and when I next visited the forest, on May 27th, it was nearly over. My courier took one specimen in the Blidah cedar forest, but we saw no others.

L. melanops, B.—Common at El Kantara in March; also in the Blidah cedar forest in May.

Adopæa lineola, O.—Common at Teniet in June, especially on the foot-hills below the forest.

A. hamza, Obth.—Very common at Teniet in June. The females had to be searched for in the long grass. Comes very close to *A. actæon*, Esp.

Parnara zelleri, Ld.—Very rare at Sebdou in August. I only took one specimen, and saw about three others.

Carcharodus alceæ, Esp.—Not very common at Sebdou in July. A small form.

Hesperia proto var. *mohammedi*, Obth.—Seemed to have several broods. In the first, which I found nearly over at Teniet in May, the few fresh specimens I did get were much paler on the under side than those of the second brood, which appeared in June; the latter coming nearer to the type in the warm colouring underneath. I also took this butterfly at Sebdou in August.

H. sao var. *ali*, Obth.—First taken near Blidah on April 30th. Occurred there in the cedar forest in May. I also took it at Teniet; but it occurred much more commonly at Sebdou than anywhere else. On the wing all through the summer, apparently having a succession of broods. *Ali* seems to me to be an intermediate form between the type and the var. *therapne* of Corsica.

H. alveus, Hb., var. (?).—One of the many varieties of *alveus* occurred at Sebdou and Tlemçen in June, July, and August, but I cannot satisfactorily determine which it belongs to!

Before closing these notes, I would like to give what little information I can about *Satyrus abdelkader*, though unfortunately I have no personal experience to draw upon. I believe the best locality for it in the Province of Oran is not Sebdou (where I doubt if it occurs at all), but a place called Nédroma, fifteen hours' drive from Tlemçen, but from its position on the map, would seem to be more easily approached from Nemours. My informant was an Arab, who volunteered this information, supplying the name of the butterfly too, quite unasked, declaring that he himself had been to Nédroma more than once with French and German collectors, and that in the month of August, *abdelkader* (he would naturally not have forgotten that name) flew in great abundance. This man also stated that it did not occur at Sebdou at all; but I should be sorry to vouch for the truth of any statements made by an Arab. Some day I hope to visit Nédroma and see for myself.

7, Lansdown Place (East), Bath: February 24th, 1906.

Miss Fountaine very kindly handed over to me the Zygænidæ captured by her in Algeria in 1904, and I therefore take this opportunity to add a list of the species included. Superficially, with the exception of *Z. favonia*, Frr., which occurred in May at Teniet-el-Haâd, and seems fairly distinct, the three most interesting, though classed in Staudinger's Catalogue as true species—*Z. loyselis*, Oberth., *Z. algira*, Dup., and *Z. ignifera*, Korb—suggest merely local forms of *Z. sarpedon* (?) and *Z. fausta* respectively. Of the far-ranging *filipendulæ-trifolii* group, I have no examples from this collection; but it includes a single *Z. carniolica* from Sebdou, which seems referable to var. *allardi*, Oberth.—H. Rowland-Brown, M.A.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY'S EXHIBITION.

By Hy. J. Turner, F.E.S.

An Exhibition of this Society was held on the evening of Saturday, March 10th, at their rooms in Hibernia Chambers, London Bridge. Although the Society still continues to hold a special exhibition of varieties each year, some years have elapsed since it had organized so extensive and so representative an assemblage of natural history objects as were placed together on this occasion. In spite of the weather, a large number of members and their friends were present, and the choice, varied, and beautiful objects—which had been tastefully arranged by the Committee and a willing band of helpers—were much appreciated.

In the British section Mr. R. Adkin exhibited (1), a long series of *Aglais* (*Vanessa*) *urticæ*, arranged to show the direction of the minor variation; (2), a collection of the Nycteolidæ and Nolidæ, including fine dark forms of most of the species; (3), the Anthroceridæ (Zygænidæ), with yellow *A. trifolii* and forms of *A. filipendulæ*, grading in colour from rich red through shades of terra-cotta to pale yellow; (4), specimen of *Mesogona acetosellæ*, from Polegate, 1895, and a long and varied series of *Tæniocampa gothica* and *T. incerta* from its main localities; (5), series of *Selenia lunaria* and *S. tetralunaria*, with hybrid *S. bilunaria* × *S. tetralunaria;* and (6), *Abraxas grossulariata* of many forms, including ab. *varleyata*. Mr. B. W. Adkin exhibited (1), local races, varieties, and aberrations of *Cosmotriche potatoria*, including males with female coloration, and *vice versâ;* (2), ditto of *Lasiocampa quercûs* and *Pachygastria trifolii;* (3), a large number of aberrations, of which a specimen of *Cosmia trapezina*—very pale, with almost black transverse band—was particularly notable. Mr. A. W. Bacot (1), the series of hybrids obtained by him from *Malacosoma neustria* and *M. castrensis;* (2), various races of *L. quercûs*, with the results of crossings between the races; and (3), a considerable portion of the progeny obtained from a pairing between *Amphidasys betularia* male and var. *doubledayaria* female, illustrative of the fact that the brood were of the two distinct forms, only one specimen being in any way intermediate in marking. Mr. F. R. Bellamy (1), a black form, var. *obscura* (?), of *Anthrocera* (*Zygæna*) *trifolii*, from Ringwood, 1899; (2), var. *fowleri*, of *Polyommatus corydon*, from Swanage; and (3), ab. *lutea* of *Callimorpha dominula*. Mr. W. Brooks a number of very large, varied, and beautiful forms of *Manduca atropos*, the selection of many years' breeding from Lincolnshire pupæ, and also specimens of the curious air bladders which are found in the body of every imago. In one case only had he found two bladders in one imago (shown). Mr. W. E. Butler (1), summer and autumn broods of *Stauropus fagi*, some extremely dark; (2), a beautiful series of *Tiliacea* (*Xanthia*) *aurago*, the extreme red forms being particularly notable, one with almost a

purple bloom; (3), a *Brenthis selene* with suppressed markings, those which did remain being united into radiations; (4), a yellow *Pyrameis atalanta*, captured; (5), *Polyommatus corydon*, in which the marginal spots on the wings were large and pure white, without any trace of the usually prominent black centres; and (6), a series of *Lachneis lanestris* which had been five and six years in pupa, &c. Mr. J. N. Carpenter showed his long and bred series of *Apatura iris*, *Colias hyale*, *Enodia hyperanthus*, *Satyrus semele*, *Melitæa cinxia*, and *Euchloë cardamines*, of various races and forms. Mr. F. B. Carr exhibited several species of living larvæ of Lepidoptera. Mr. J. A. Clark a case containing a number of extreme and beautiful varieties of *Arctia caja*. Mr. T. W. Hall (1), a long and varied series of the genus *Eupithecia*; (2), a most interesting life-history of the rare *Ægeria* (*Sesia*) *sphegiformis*; (3), series and examples of species, either extinct or disappearing as British, including *Chrysophanus dispar*, *Nomiades semiargus* (*acis*), *Noctua subrosea*, *Lælia cœnosa*, and *Cleora viduaria*; and (4), two cabinet drawers of rare species and varieties, including *Crymodes exulis*, *Xylomiges conspicillaris*, spotless forms of *Mamestra persicariæ*, yellow forms of *A. filipendulæ*, yellow-banded *Æ. culiciformis*, bred *Dicranura bicuspis*, with pupa case, &c. Mr. A. H. Hamm exhibited a case of varieties and aberrations, including a *Chrysophanus phlæas* with a large black costal blotch extending well into the disc of the fore-wing, and a beautiful smoky aberration of *Acidalia immutata*. Messrs. A. Harrison and H. Main (1), long series of various generations of *Amphidasys betularia* and var. *doubledayaria*, from various localities, with six out of the seven gynandromorphous examples obtained from one of the broods; (2), various series of *Aplecta nebulosa*, from the usual grey colour to the almost black form; (3), a large number of aberrations and forms of *Triphæna comes* from many localities, from light grey to red and to almost black; (4), *Satyrus semele*, from the chalk hills of the south-east, with light ground and lighter undersides, and from Cornwall and the Isle of Man, with much darker ground on both surfaces; (5), a drawer of most varied and beautiful *Triphæna fimbria*; (6), three drawers of various broods of *Pieris napi*, including a series of Irish parentage and also a series bred from Swiss var. *bryoniæ*; (7), a long series of *Colias edusa* and var. *helice* bred from a var. *helice* taken in South of France, including some very beautiful intermediate forms; (8), fine series of most of the Lycænidæ, including some very fine forms of *Lycæna arion*; (9), several drawers of Vanessidæ, &c., mostly bred; (10), a large number of aberrations, of which the following are the more notable:—*Nemeophila russula* males, with the marginal bands on the hind wings obsolete, black forms of *Cymatophora duplaris* from Lancashire, males of *Cosmotriche potatoria* with female coloration of pale yellow, and one intermediate in colour between typical male and female, some black aberrations—var. *melanocephala* of *Acronycta leporina* from Lancashire, melanic specimens of *Agrotis exclamationis*, *Grammesia trigrammica* with the submarginal area dark shaded, and one with the wings, thorax, and abdomen dark, as in var. *bilinea*, but with the central line plainly visible, an *Odontopera bidentata* with dark hind margins and pale central and basal areas to fore wings, var. *fuscata* of *Hybernia marginaria* from Lancashire and Cheshire, and intermediates from Epping, &c.;

Melanippe fluctuata of a pale ochreous ground with a much diminished central band, and extremely beautiful rosy specimens, var. *subroseata* of *Zonosoma pendularia*. Mr. J. Hickman exhibited two broods of *Arctia caja* from Wye, in which considerable aberrational intensification of the dark markings was apparent. Mr. L. W. Newman (1), bred series of the genus *Notodonta*; (2), hybrids between *Smerinthus ocellata* and *Amorpha populi*, *Notodonta ziczac* and *N. dromedarius*, *Selenia tetralunaria* and *S. bilunaria*; (3), bred series of *Nyssia lapponaria*, *Leucania vitellina*, melanic *Boarmia gemmaria*, *Dasycampa rubiginea*, &c., &c.; and (4), very varied series of *Melitæa aurinia*. Mr. Percy Richards, a large number of varieties and aberrations, of which the following are a few:—(1), *Dryas paphia*, intermediate between the type and var. *valesina*; (2), a very grey-coloured *Limenitis sibylla*; (3), a suffused red, a salmon-pink confluent spotted, a pale straw-yellow, and forms with yellow hind wing on one side only of *Anthrocera trifolii*; (4), a *Uropteryx sambucata* streaked with grey, quite freshly emerged; (5), *Rumia luteolata*, with the reddish-brown markings absent; (6), a number of intermediate forms between *A. betularia* and var. *doubledayaria*; (7), his specimen of *Plusia ni*, from Kingston Hill; (8), an *Abraxas grossulariata* with deep yellow ground colour; (9), a black form of *Thera variata*, from Kingston Hill; and, on behalf of Mr. E. Warne, a pale-grey-all-over form of *Melanippe fluctuata* and *Bupalus piniaria* with black markings on the grey outer border. Mr. A. Sich exhibited specimens of the new British species discovered by him, *Argyresthia illuminatella*, with allied species for comparison. Mr. R. South (1), various forms of *Aphantopus hyperanthus*, including ab. *lanceolata*, ab. *arete*, ab. *obsoleta*, &c.; (2), a *Brenthis euphrosyne* with much reduced markings on fore wings, and a black patch occupying the whole basal two-thirds of the hind wings; (3), *Pararge megæra* with extra apical spots, and a female with very wide lines on fore wings; (4), orange-tinged *Gonepteryx rhamni*, from West Kent; (5), a var. *eleus* of *Chrysophanus phlæas*, and three very pale-coloured specimens; and (6), examples of var. *syngrapha* of *Polyommatus corydon*, and one specimen with normal fore wings and var. *syngrapha* hind wings. Mr. South also exhibited, on behalf of the Rev. W. Claxton, (1), intermediate coloured males of *Cosmotriche potatoria*; (2), male *Malacosoma castrensis* with female coloration; (3), *Dianthœcia luteago*, var. *ficklini*, from Cornwall; (4), very dark *Psilura monacha* from New Forest parents; and (5), a dark form of *Scopelosoma satellitia*. Mr. H. J. Turner a large number of life histories of the species of the genus *Coleophora*, showing imagines, cases of the larvæ at different stages of growth, and leaves of the food plants mounted to show the characters of the depredations of the larvæ. Mr. C. P. Pickett, very long series with numerous and striking varieties of many species of Lepidoptera.

In Coleoptera the exhibits were very few indeed. Mr. W. West, of Greenwich, exhibited an extremely large specimen of the stag-beetle (*Lucanus cervus*). Mr. W. E. Butler, a series of the Coleopteron *Phymatodes lividus*, a species new to the British List, discovered by him at Reading. Mr. S. R. Ashby, a large number of species of Coleoptera.

Mr. West, of Greenwich, was the only exhibitor of Hemiptera, of

which he exhibited the whole of his collection, comprising more than three-fourths of the indigenous species. The Society exhibited its type collection of Orthoptera. Mr. H. T. Dobson was the only exhibitor of Odonata, by a collection of species made by him last year on the Norfolk Broads, including *Æschna isosceles*, *Libellula fulva*, *L. dubia*, *Sympetrum sanguineum*, &c. Mr. Stanley Edwards showed a very handsome case of working bees, *Apis mellifica*, and also an observation nest of living ants, *Formica flava*.

In the Foreign Section Mr. C. Boxer exhibited a small collection of South African butterflies. Mr. Stanley Edwards exhibited a large number of exotic Lepidoptera from his extensive collection, including several sections of the genus *Papilio*, a number of the larger *Morpho* species, and series of several species of each of the genera *Urania*, *Nyctalemon*, *Thais*, *Armandia*, *Teinopalpus*, *Eurycus* and *Sericinus*. Mr. A. Hall, an extremely fine collection of the various species of the genus *Catagramma* and its allies from South America, together with series of forms and aberrations of *Apatura iris* and *A. ilia*. Mr. W. J. Kaye showed more than two hundred specimens of butterflies taken in one forest path in British Guiana, to illustrate the principal mimetic groups of the locality. They were of the following sections:—Danainæ, Nymphalinæ, Heliconinæ, Ithomiinæ, and Erycinidæ. Mr. McArthur exhibited a case containing the largest and smallest known species of Lepidoptera, viz., *Thysinia agrippina* from South America, and *Nepticula prunetorum*. Mr. W. G. Sheldon exhibited a number of Spanish Lepidoptera, including fine series of the purely Spanish *Satyrus pieuri* and *Erebia zapateri*, together with series of *Argynnis pandora*, *A. niobe* var. *eris*, &c.

The Society exhibited several drawers of its collection of Canadian Lepidoptera. Mr. J. W. Tutt exhibited long series of several species of Continental butterflies with a number of palæarctic extra-European species for comparison—(1), *Euchloë euphenoides*, males very variable in size, females extremely dissimilar in the amount of orange marking at the tip of the fore wing, with *E. eupheno* from Morocco; (2), *Leptosia sinapis*, spring form from the Riviera; (3), *Pararge egeria*, with every possible gradation between the dark form of Britain and the bright-tinted southern form; (4), *P. megæra*, with very interesting Corsican forms; (5), *Polyommatus bellargus* and *P. corydon*, including the sky-blue Spanish form of the latter species as well as the white form, and most interesting as showing the lines the variation takes in the two species; (6), long series of *Chrysophanus virgaureæ*, *C. alciphron* including var. *gordius*, and *C. hippothoë* including many exceedingly fine, distinct, and extreme forms from many localities, the females in particular running into most beautiful forms. Mr. West, of Greenwich, a specimen of the Goliath beetle from West Africa. Mr. H. Moore, a number of large European and exotic Orthoptera and a drawer of European Ædipodidæ. Mr. Edwards, cases of exotic Phasmidæ and Mantidæ.

The walls and screens were covered by a large number of photographs and photomicrographs of biological subjects. Mr. F. Noad Clark showed many minute insect structures; Mr. J. Edwards, insects and spiders in their environment; Mr. Goulton, lepidopterous larvæ in

their environment; Mr. Hugh Main, the protective resemblance exhibited by larvæ such as *P. smaragdaria* and *G. papilionaria*; and Mr. Tonge, nature studies of various species of Lepidoptera, the ova, larvæ and imagines in their natural surroundings.

The following gentlemen lent microscopes:—Mr. H. E. Barren, Mr. A. Cant, Mr. A. W. Dennis, Mr. F. J. East, Mr. Stanley Edwards, Mr. H. S. Tremlin, Mr. E. C. Goulton, Mr. W. J. Lucas, Mr. R. A. Priske, Mr. W. West (Ashstead), Mr. C. West, and Messrs. R. and J. Beck (six). The various objects shown by these gentlemen were much appreciated. A notable feature of this table was the Ashe-Finlay comparoscope, exhibited by Messrs. Beck, a microscope arranged with two object-glasses and two stages to exhibit two objects side by side for comparison.

At half-hour intervals during the evening, the following gentlemen exhibited lantern-slides and gave short demonstrations:—Mr. E. C. Goulton, Mr. H. Main, and Mr. H. C. Head showed details of the life-history of various species of Lepidoptera, Mr. Tonge showed the ova of many species of butterflies, Mr. F. Noad Clark minute microscopic insect structures, Mr. F. Enock showed coloured slides of protective resemblances in insects. Messrs. W. J. Lucas, A. W. Dennis, and E. Step also showed slides.

The Society's lantern was under the charge of Mr. F. Noad Clark the whole evening, who carried out all the arrangements for the demonstrations without a hitch. A large number of exhibits of other Orders by members and friends gave variety and attraction to the meeting.

The arrangements for tea were admirably made by Mrs. R. Adkin and Miss Adkin, who, together with Mrs. T. W. Hall and other ladies, attended to the refreshment room.

NOTES AND OBSERVATIONS.

Melanic Lepidoptera.—At the meeting of the British Association, to be held this year at York (August 1st to 8th), it is proposed that there shall be an exhibition of British Lepidoptera, illustrating melanism. The organizing committee of the Zoological Section invite those who are willing to take part to communicate with Mr. L. Doncaster, Zoological Laboratory, Cambridge, stating the species and number of specimens which they are prepared to send. It is hoped that a paper on "Melanism" will be read at the meeting by Mr. G. T. Porritt, of Huddersfield, and that it will be followed by a discussion.

Vanessa urticæ in Hybernation.—In the 'Entomologist' for December, 1905, page 311, I recorded an instance of the early hybernation of a specimen of *V. urticæ* at the beginning of July last. It awoke from its long slumber on April 7th, although numbers of the same species were abroad weeks before. This particular specimen I saw daily, and I think I may truthfully say it never once moved a limb from the first position it took up; spiders' webs had fallen across, and floated from its folded wings, and dust naturally accumulated around

it, yet, on the day of its awakening, it looked clean and fresh, and was exceedingly active. Thus, for nine months, animation seemed to be totally suspended as far as outward appearances were concerned, this repose differing very materially from a former chapter in its life-history, when, in the chrysalis state, the limbs of the future butterfly were being formed; and if an object-lesson on fasting were needed, this might excite the most morbid curiosity.—G. B. Corbin; Ringwood.

Aplecta nebulosa, var. thompsoni (Arkle).—I regret I am unable to agree with any proposal to include the variety *thompsoni* with *robsoni*. The two names mark the two culminating departures from the Delamere type, and each is unlike the other. A long experience enables me to say, without hesitation, that no two examples of Delamere *nebulosa* can be picked out so unlike each other as the varieties *robsoni* and *thompsoni*. In the latter, the ground-colour of the upper wings is jet-black, with white margins and fringes; in the original *robsoni*, as well as in present-day examples, the ground-colour is black-brown, with grey fringes. My experience shows, further, that photographs are frequently unreliable as entomological illustrations. For example, the jet-black of *thompsoni* and the black-brown of *robsoni* appear in a photograph as equal tones. Mr. South writes (*ante*, p. 76):—"Except that fig. 10 (*thompsoni*) has a white crenulate line on the outer margin of the fore wings, and that the fringes are white instead of brownish grey, it is not otherwise very clearly separable from fig. 8, which has been recognized by Mr. Collins as agreeing with his type of *robsoni*." Transposed, this means that *thompsoni* is very clearly separable from *robsoni* by two notable characters—(1), a white crenulate line on the outer margin of the fore wings; and (2), the white fringes. I do not think any attempt will be made to give distinctive names to Delamere *nebulosa* intermediates. The history of *thompsoni* will probably act as a deterrent.—J. Arkle; Chester.

Acronycta leporina var. melanocephala.—I am honoured by Mr. A. M. Cochrane's notice ('Entomological Record,' April 15th, 1906) of my article upon the above insect, which appeared in the 'Entomologist' (vol. xxxviii. 289, and vol. xxxix. 19). I gather from this criticism that the writer of it wishes to set aside the prior claim of Treitschke to the name *bradyporina* for our grey form of *leporina*, and to transfer the name *bradyporina* to the new variety, thus deleting the varietal name *melanocephala*. He further suggests the substitution of a new name, *grisea*, for the present usage of *bradyporina*, thus, in a breath, setting aside the authority of Treitschke, Hübner, and Staudinger on the Continent, and Stephens and Tutt in this country. I wonder what the strict systematists will say to such an attack upon the law of priority. As to the variety described in my notes to the 'Entomologist,' if my critic can show that the form described by the above-named authorities as *bradyporina* had a black thorax, and that, in the coloration of the fore wings and body, black predominated, or that it was materially different from the form so long known as *bradyporina*, or, in other words, if he can show that when grey or dirty-grey was written black was intended, there may be a case for the suppression of the varietal name *melanocephala*. Whatever future research

may decide, I think that most entomologists will agree with Mr. Tutt's acceptance of *bradyporina* for the greyish form we most frequently get in England; and also, when they have seen the, at present, scarce variety which I have called *melanocephala*, that it is distinctly a melanic race, characterized by a predominance of black in the coloration of the fore wings, and with black thorax and abdomen.—WM. MANSBRIDGE.

ISCHNURA ELEGANS IN SPAIN.—Mr. K. J. Morton calls my attention to the fact that *Ischnura elegans* has at last been recorded from Spain, on the strength of specimens now in his collection, and which were were sent for *I. graellsii*. The record is in the 'Bulletin of the Spanish Natural History Society.'—W. J. LUCAS.

EXTRAORDINARY NUMBER OF PUPÆ OF CULEX HIRSUTIPALPIS.—On November 21st, 1905, while journeying from the Port of Benguella, West Africa, to Chiyaka, in the interior, I noticed two small pools by the roadside near a native village, and which appeared from a little distance to be of a brown colour. On approaching them, I found the surface of the water literally packed with mosquito pupæ. Over most of the surface of the smaller pool (in which they were most numerous, and which comprised an area about two yards square), the pupæ lay as closely together as capillarity would allow, while only in a small space less than a foot square, near the middle of the pool, did they seem to be perceptibly scattered. On watching them for some minutes, I observed a wave-like motion throughout the brood, which went on after the following manner at nearly regular intervals. At one edge of the pool the pupæ sank out of sight and quickly rose again to the surface, their neighbours following suit until the opposide side was reached, the whole procedure producing the odd impression of a bar of clear water, about eight inches wide, which appeared to move across the pool like the shadow of a narrow plank. As the pupæ rose each time many could be seen struggling for room to protrude their spiracles, and the lack of space perceptibly delayed the appearance of some. Of course the pupæ sank when I placed my hand near the water, but after holding it quiet until they rose again, I made a quick dip with a flaring cup about five inches across. In this manner I secured over six hundred pupæ, besides a few larvæ of different sizes. About eleven hundred pupæ would have completely occupied the surface of the water in the cup. There seemed to be but few larvæ in the pool, but I saw eighteen egg-rafts. On breeding out some of the pupæ they were seen to be *C. hirsutipalpis*, Theob.—F. CREIGHTON WELLMANN; Benguella, West Africa, February 25th, 1906.

THE BARRETT COLLECTION OF BRITISH LEPIDOPTERA.—The first portion of this notable collection, comprising all families to the end of the Geometridæ, was disposed of in 304 lots by Mr. J. C. Stevens at the well-known auction rooms in King Street, Covent Garden, on March 13th last.

Owing to pressure on our space we are unable to report results in any detail, and the following notes therefore only refer to the more important items. Among the Pieridæ there was one lot of sixty-eight specimens including a fine sulphur-yellow example of *Pieris napi*, and

for this lot 50/- was given. A specimen of *Chrysophanus phlæas*, with the hind wings entirely brown and the disc of the fore wings only coppery, made five guineas. Four specimens of *C. dispar* ranged in price from three guineas to five guineas, and a male of this extinct butterfly, together with an example of the *schmidtii* form of *C. phlæas*, went for £2. Five male and two female specimens of *Lycæna acis* were sold for £5 15s. A black *Limenitis sibylla*, from Reading, was not dear at 30/-, the price at which it was bought. Six pounds sterling was given for a specimen of *Vanessa urticæ* with black hind wings; and two guineas for a specimen of *V. antiopa* captured near Hastings in September, 1889. Two other authenticated examples of the last-named butterfly went for 14/- and 20/- each; while a specimen of *Argynnis lathonia*, taken at Dover in 1872, brought in 28/-. Three specimens of *Epinephele tithonus*, one whitish, and one with extra ocelli, sold for 20/-. A parcel of forty-four "skippers," including two specimens of *Hesperia* (*Syrichthus*) *alveus* from Norfolk, realized £2. An example of *Hyloicus pinastri*, from Aldeburgh, sold for 25/-; ten specimens of *Deilephila galii* made £3 2s. 6d., and one example of *D. euphorbiæ*, taken at King's Lynn in 1887 (C. G. B.), went for 45/-. There were eleven specimens of *Lælia cœnosa*, and these realized £6 0s. 6d., the highest price being 47/6 for a pair, and the lowest 18/- for four specimens. Of *Epicnaptera ilicifolia* there were two males and a female; the former sold at 21/- and 16/-, and the latter fetched 26/-. Two males and a female of *Drepana harpagula* (*sicula*) realized 51/-, and two *Cerura bicuspis*, together with thirteen *C. furcula*, made 20/-. One example of *Leucodonta bicolor* from Burnt Wood sold for 20/-. Four lots, each comprising ten *Acronycta alni* and five *A. strigosa*, went for 21/-, 24/-, 22/-, and 21/-. Five examples of *Noctua subrosea* were submitted in two lots, one of two specimens, the other of three specimens; each lot sold for 20/-. A specimen of *Hadena satura*, from Reading, with other things included, made 32/6. For three Shetland specimens of *Crymodes maillardi* (*exulis*) the bidding ran up to 70/-; the same number of *Dianthœcia barrettii*, including the original specimen, found a buyer at 45/-, whilst three others from Dublin made only 16/-; for another lot of three specimens, one of which was from North Cornwall, and one bred from a larva, the price rose to 45/-. A lot comprising five *Agriopis aprilina*, one without black markings, sold for 30/-. Seventeen *Nonagria sparganii*, put up in three lots of four specimens and one lot of five examples, realized a total of £4 19s. 6d. Two useful lots of *Senta maritima* (*ulvæ*), each containing eleven specimens, and including the typical and three named forms, made 11/- per lot. The one example of *Synia musculosa* in the collection sold for 21/-; and a lot comprising three *concolor* among other things fetched 20/-. *Leucania favicolor*, the male and female types, made 20/- each, but a reddish male fetched 24/-, and another male went for 22/-. Of *Pachnobia alpina* there were a dozen specimens, and these were sold in half-dozens at 20/- per lot. For two specimens of *Hydrilla palustris* 26/- was given, whilst 10/- bought a couple of *Laphygma exigua*. Twelve specimens of *Xylina conformis*, from South Wales, were sold in fours at 30/- for one lot, and 32/6 for each of the other lots. An odd *conformis* with other species went for 21/-. There were two specimens of *Cucullia gnaphalii*, and each of these made 14/-. A

Norfolk example of *Heliothis scutosa* was bought for 22/–, and a hybrid *A. prodromaria-betularia* for the same sum.

A pair of *Nyssia lapponaria* went for 16/–, and a pair of *Cleora angularia* (*viduaria*) made £2. Among a few varieties of *Abraxas grossulariata* was one of var. *varleyata*, which realized 32/6. A specimen of *Sterrha sacraria*, taken at Dulwich (C. G. B.), produced 16/–. Three specimens of *Lygris* (*Cidaria*) *reticulata*, put up together, brought in 30/–. Fine examples of *Phibalapteryx polygrammata* sold for 22/–; and two lots of *Eupithecia consignata*, ten specimens in each, yielded 12/– and 20/– per lot.

CAPTURES AND FIELD REPORTS.

VANESSA ANTIOPA IN CAMBRIDGESHIRE.—A specimen (recorded in the 'Field,' April 7th) was seen at Little Shelford, on April 3rd, by Mr. G. F. O. Bagnall, which settled by the roadside, but it evaded his attempt to capture it.—F. W. F.

OROBENA STRAMINALIS IN SURREY.—In turning over the 'Entomologist' for 1904, I came across Mr. South's note on Surrey localities for this insect. I took six or eight specimens last summer near Bletchworth.—H. V. PLUM; Epsom College, March 9th, 1906.

EUGONIA (VANESSA) POLYCHLOROS.—I should very much like to know what has been other people's recent experience of *E. polychloros* in this country. When I was a child, and for many years afterwards, it was common hereabouts; then it disappeared entirely for several years, and I shall never forget my pleasure at once more seeing hybernated specimens in Harington Hall Wood after its long absence. Soon afterwards it gradually became common again, and was to be met with in all directions until 1901. In that year it was so excessively abundant in North Essex and on the Suffolk side of the River Stour that I could have taken hundreds of broods had I required them. They were so abundant on elm trees in Colchester as to cause people to take steps to destroy them, under the delusion that they were likely to prove exceedingly injurious, and I saw one very tall elm hedge in the outskirts of the town which, for a considerable distance, was entirely defoliated by them. But, strange to say, I only saw two or three of the perfect insects later in the year, and from that time to this not a single specimen has appeared, either in the spring or late summer. How is this to be accounted for? My own theory is that all the specimens which emerged in 1901 at once emigrated, that the species is practically extinct here now, and that it is quite uncertain when a fresh lot of immigrants will appear and repopulate the district, though this may happen any season. I have noticed that certain of the "agricultural entomologists" have continued to offer the larvæ at quite nominal prices, but whether they have been able to supply them I do not know. It would be singular if the exodus of the species from this part of England was due to conditions which have not operated in a similar manner elsewhere.—W. H. HARWOOD; Colchester, April 17th, 1906.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March* 21*st*, 1906.—Mr. F. Merrifield, President, in the chair.—The Rev. George A. Crawshay, M.A., of "Lowlands," Leighton-Buzzard; Mr. Hereward Dolman, of Hove House, Newton Grove, Bedford Park, W.; Mr. Edward Dunkinfield Jones, of "Castro," Reigate; Mr. John Neville Keynes, M.A., Sc.D., of 6, Harvey Road, Cambridge; Mr. D. L. McCarrison, Indian Police Forces, Madras Club, Madras; and Mr. George E. Tryhane, of Trinidad, were elected Fellows of this Society.—Dr. F. A. Dixey exhibited six female examples of the Pierine genus *Eronia* with corresponding males, and drew attention to the extreme diversity shown by the males in these closely allied species. He considered that this characteristic was due to the fact that in every instance the male had been diverted from the ordinary aspect of the group by the operation of mimicry, either Müllerian or Batesian. The species of entirely different affinities which had acted presumably as models were associated also with the exhibit.—Mr. R. Adkin showed two specimens of *Emmelesia unifasciata* which had emerged in August last from pupæ which had lain over since the autumn of 1900, thus having passed five seasons in the pupal stage.—Dr. T. A. Chapman, M.D., exhibited a number of specimens from the Riviera, Sicily, &c., and read a paper on the "Progressive Melanism in the Riviera of *Hastula hyerana*." A discussion followed on melanism and its causes, in which Mr. G. T. Porritt, Dr. F. A. Dixey, the President, and other Fellows joined.

Wednesday, April 4*th*, 1906.—Mr. C. O. Waterhouse, Vice-President, in the chair.—Mr. Leonard Doncaster, M.A., King's College, Cambridge; Major F. Winns Sampson, H.M. Travelling Commissioner, Senior Officers' Mess, Old Calabar, Southern Nigeria; and Mr. Raleigh S. Smallman, Wressil Lodge, Wimbledon Common, S.W., were elected Fellows of the Society.—Mr. H. St. J. Donisthorpe exhibited a specimen of the very rare ant *Formicoxenus nitidulus*, a neuter, found in a nest of *Formica rufa* at Weybridge during the present month. Mr. A. J. Chitty said he had taken a single male of the species in the Blean Woods, and the Rev. F. D. Morice reported it common in Switzerland, where he had taken examples of all three sexes abundantly.—Mr. G. C. Champion showed a specimen of *Platypsyllus castoris*, Ritsema, a Coleopterous parasite of the beaver, from France, and suggested that perhaps it might be found on the beavers in the London Gardens of the Zoological Society.—Mr. W. G. Sheldon exhibited several specimens of a Noctua which he said corresponded to Dr. H. Guard-Knagg's original description of *Agrotis helvetina* ('Entomologist's Annual,' 1872). He had purchased them at the sale of the late Dr. Mason's collection, in which they were labelled as light varieties of *Noctua augur*, to which species he thought, in fact, that they should be referred.—Mr. A. H. Jones exhibited examples of butterflies taken by him last year in Majorca showing injury to the wings, caused in his opinion by the attacks of lizards. He remarked that a large proportion of the few butterflies met with in the island were mutilated, especially at the posterior part of the hind wings.—The Rev. F. D. Morice gave an account of the calcaria observed on the legs of some Hymenoptera.

They were, he said, quite constant in each species, and useful, therefore, as distinguishing characters; the only hymenopteron he had come across without them being the ordinary hive-bee. Kirby and Spence considered that they were used for climbing purposes, but this was unlikely, as the spurs occurred in species which did not climb at all. So far as he had noticed they were used by members of this order for the purpose of cleaning their antennæ.—Mr. C. O. Waterhouse said that similar spurs existed in the Trichoptera, though they did not assume as beautiful forms as in the Hymenoptera; but, as to their uses he was not aware that any observations had been published or made on the subject. Mr. G. C. Champion remarked that they were also well developed on the hind legs of some Coleoptera.—H. Rowland-Brown, *Hon. Sec.*

Lancashire and Cheshire Entomological Society. — The usual monthly meeting of this Society was held in the Royal Institution, Colquit Street, Liverpool, on Monday the 9th inst.—Richard Wilding, Esq., Vice-President, occupied the chair, and eight new members were elected.—F. N. Pierce, Esq., F.E.S., read a short paper on the genital armature of the hybrid moth *Notodonta ziczac* × *N. dromedarius*. The paper was capitally illustrated by drawings and microscopical preparations of the parts described, as well as by the exhibition of the insects. The lecturer further pointed out the difficulty of obtaining specimens of such rare forms for dissection—Dr. J. Cotton, F.E.S., then read a paper upon the lepidopterous fauna of Knowsley Park; some thirteen species of butterflies, and two hundred and ten species of moths were enumerated as having been found in the park; and the lecturer, in the course of his remarks, gave a description of the biographical details of the locality. A discussion ensued, in which most of the members present took part.— Mr. W. A. Tyerman exhibited a long bred series of *Acronycta rumicis*. Mr. W. Mansbridge, a series of *Larentia multistrigaria* including melanic forms from West Yorkshire; also a specimen of *H falcataria*, set so as to show the resemblance of the moth to the head of a mouse.—H. R. Sweeting & Wm. Mansbridge, *Hon. Secs.*

OBITUARY.

We have, with much regret, to announce the death of Mr. Ebenezer Sabine, of Erith. He had been in feeble health for some time, and he passed peacefully away on April 12th last. His age was 72 years, and he had devoted the greater part of his life, being a man of leisure, to the formation of an extensive and valuable collection of British butterflies. He was especially keen on varieties, and his literary contributions to this Journal were chiefly upon matters relating to variation in butterflies. Only specimens in the finest possible condition were included in his cabinets, and very many of them were reared by himself from eggs or from collected larvæ.

Although of a somewhat retiring disposition, he was ever ready to furnish information or material to anyone seeking his assistance.

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DESCRIPTION OF A NEW GENUS AND SPECIES OF CICADIDÆ FROM CHINA.

BY W. L. DISTANT.

Sub-family TIBICININÆ.

Division TAPHURARIA.

Hea, gen. nov.

♂. Head short, broad, including eyes about as wide as base of mesonotum, eyes prominent, projecting beyond the anterior angles of the pronotum, front only about half the length of vertex, anterior ocellus placed near front margin of vertex; face almost as far removed from the eyes as its breadth, depressed near base, longitudinally sulcate and with very strong transverse ridges; rostrum reaching the intermediate coxæ; pronotum longer than head but shorter than mesonotum, its lateral margins moderately rounded and sinuate near anterior angles, its posterior angles obliquely prominent; mesonotum with the lateral margins angulate near base, the cruciform elevation short and broad; abdomen about as long as space between apex of head and base of cruciform elevation; tympana entirely exposed; opercula small, not reaching base of abdomen and not completely covering the cavities; anterior femora armed beneath with four spines, the apical spine very short; tegmina and wings hyaline;

tegmina less than three times the length of greatest breadth; tegmina with the basal cell longer than broad, the postcostal area moderately wide, apical areas eight, transverse vein at base of second apical area vertical; lower ulnar area long, narrow, its upper vein curved; wings with six apical areas.

I place this genus near *Dorachosa*, Dist.

Hea fasciata, sp. n.

♂. Head above black, anterior margins of front and vertex, and a narrow central line to both ochraceous; pronotum and mesonotum brownish ochraceous with a broad central greenish yellow fascia margined on each side with black, narrower on pronotum and broader on mesonotum, lateral margins of pronotum pale ochraceous inwardly margined with black; abdomen dark ochraceous, with a central paler longitudinal fascia and with two black spots near base; body beneath and legs stramineous, central transverse ridges to face, space between face and eyes, clypeus, apex of rostrum, shadings to anterior and intermediate coxæ, and streaks to anterior femora black; tegmina and wings hyaline with a slight bronzy tint, extreme bases, the costal membrane to tegmina, and basal half of anal area to wings testaceous red; tegmina with the basal cell and lower ulnar area more or less ochraceous, the margins of the latter and its apex fuscous. Long. excl. tegm. 16 millim. Exp. tegm. 45 millim.

Hab. China.

I have no more precise locality for this species, which was procured at the sale of the collections of Mr. R Cholmondeley some ten years ago. I have refrained from describing it before, trusting that I might receive another better localized specimen from other sources, but this has not occurred.

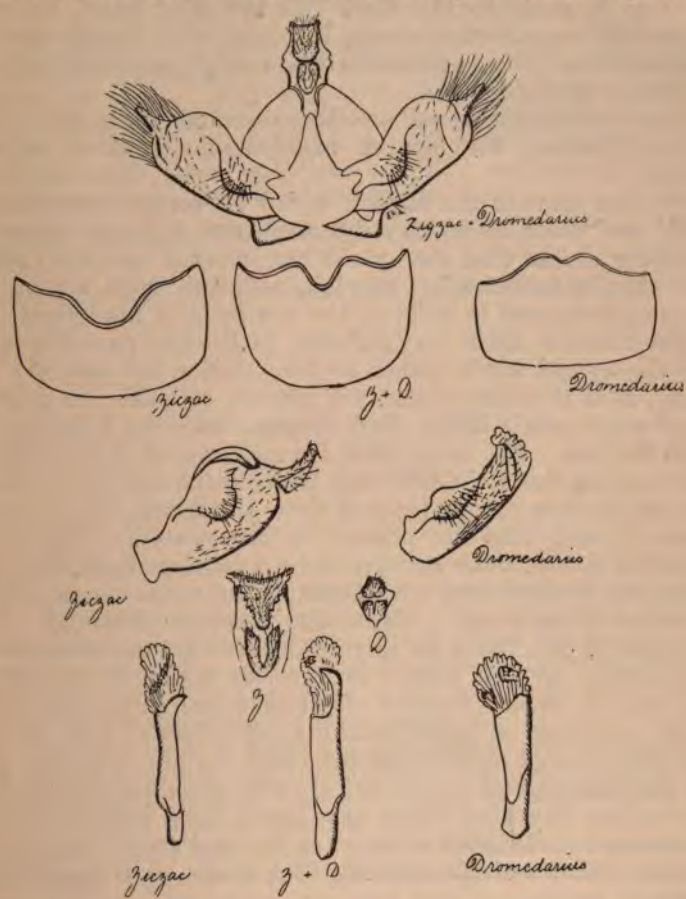
In the type one tegmen possesses eight apical areas, and the other only seven.

NOTES ON HYBRID *NOTODONTA ZICZAC-DROMEDARIUS*.

By F. N. Pierce, F.E.S.

So rarely do hybrids find their way to the microscopist that I would like to place on record the thanks of all structure workers, and those entomologists interested in anatomy, to Mr. L. W. Newman, of Bexley, Kent, who is so anxious for science that he sacrificed two lovely specimens of this rare hybrid *N. ziczac-dromedarius* in order that another link might be added to the all too little known structure of the curiously mixed genital organs of hybrids. About the middle of July last Mr. A. Bacot wrote and asked me if I would undertake the examination of two specimens, which I readily assented to. Mr. Newman had written to him as follows:—"Enclosed are two hybrids

ziczac-dromedarius. I found them *in cop.* at 11 p.m., Friday night, in the cage, and they stayed paired till 9.30 p.m. Saturday night, and then flew round, when I killed them, as both to me look like males. I send them to you to do as you like



with them; pull to pieces and report on the organs, &c., for the good of science."

I made a number of preparations of normal examples of the two species, and then prepared the two hybrids.

The drawings I have made will perhaps give a better idea of these little understood parts than a long description. I will therefore try and point out the more noticeable differences. The first figure is a drawing of the harpes and uncus in position of the hybrid. Both specimens are the same, and do not differ *inter se.* They are distinctly male in character; no traces of female organs are to be found. It is interesting here to note that I

found the same perfectly formed male organ in the male hybrid *Sphinx ocellatus-populi*; but in the female the parts were very distorted, and portions of the male organs intermixed. The condition of the female organ I should say would make it impossible for them to continue the race. On the other hand, the male organs are so perfectly formed, I should think it quite possible that they would cross again with one or other, or perhaps both, of the female parent species.

Below the first figure are the terminal segments of the different bodies, the hybrid being a modification of both species.

We now come to the harpes, which on comparison with the hybrid are found to be very different; and it is not altogether surprising to find that the hybrid has followed one, viz., *ziczac*, more than a modification of each, although there are certain traces of each used to build up the new form of the hybrid.

The uncus is again very different in the two parent species; here the hybrid tends rather to *dromedarius*, but not very distinctly, as it is unlike either, yet savours of both. In point of size *ziczac* is much larger than *dromedarius*; the hybrid is between the two. The penis itself is much nearer *ziczac* than the other species, the main difference between the two being that in place of the long row of teeth of *ziczac* the hybrid has the small patch of teeth that are present in *dromedarius*. Taking the organs all round, there appears to be a little more of the *ziczac* form than *dromedarius*, and perhaps leads one to expect the coloration of the imago to lie in that direction; this is so. After my report to Mr. Bacot he very kindly sent me the remainder of the insects. At first glance the hybrids appear to be a pretty grey form of *ziczac*; then on closer examination we find all the strong markings of each faithfully reproduced. The modified orbicular, the red marking on the inner margin near the apex, and the submarginal row of red spots of *dromedarius* being very noticeable. The hind wings are lighter than either, and have the stronger dark blotch of *ziczac* at the anal angle; in fact, it is difficult to find a single marking that is not reproduced in the hybrid.

The scales are interesting, but difficult to be quite sure that the same portion of each wing is tapped. Generally speaking, the larger scales of *dromedarius* are four-toothed, rarely five. *Ziczac* has five, six, and sometimes more teeth. In the hybrid there are usually three; occasionally there are four teeth, and I have failed to find one with five teeth. In the scaling there appears to be a tendency to produce a new form of scale, possibly an inferior one, rather than a modification of the forms possessed by the parents.

The Elms Dingle, Liverpool: April 9th, 1906.

A NEW SPECIES OF *CHARAXES* FROM RHODESIA.

By Percy I. Lathy, F.Z.S., F.E.S.

Charaxes peculiaris, sp. nov.

♂. Upper side: Fore wing similar to *C. penricei*, Rothsch., but white markings slightly larger, and the blue of the former species replaced by green. Hind wing as in *C. penricei*, Rothsch., but blue replaced by green, and only the faintest trace of red markings on outer margin. Under side: Both wings, as in *C. penricei*, Rothsch., but red markings not so bright and black, and dark markings heavier; the subapical red spot of fore wing is wanting.

Hab. Kavama, North-eastern Rhodesia. In coll. H. J. Adams.

A single male of this remarkable species was obtained.

NEW AMERICAN BEES.—I.

By T. D. A. Cockerell.

Perdita pratti, n. sp.

♀. Length not quite 6 mm. In my tables (Proc. Phila. Acad. 1896) runs to *obscurata*, but differs by the coloration of the clypeus, &c. The abdominal bands are so nearly continuous that it might run to *bigeloviæ*, but it differs from that in the lateral face-marks, &c. It is really close to *P. crawfordi* (described since the tables were published), but differs by having the lateral face-marks more produced above, and the abdominal bands bright yellow.

Maxillary palpi 6-jointed; labial palpi 4-jointed, approximate length of the joints in μ (1.) 675, (2.) 210, (3.) 105, (4.) 90; head and thorax yellowish green, the vertex dullish, the mesothorax fairly shiny, and very hairy; clypeus not hairy; *mandibles dark ferruginous, without any yellow*; apical half of flagellum brownish ferruginous beneath; light marks of face confined to clypeus and lateral marks, which are lemon-yellow; clypeus with the usual dots, the anterior middle more or less broadly brown, and faint brown marks indicating rudiments of longitudinal bars; supraclypeal area black with a purplish lustre; lateral face-marks triangular, much longer than broad, ending in a point on orbital margin a little above level of antennæ, the long inner slope inclined to be notched; upper lateral corners of prothorax yellow, and a little yellowish on tubercles; tegulæ pale testaceous; stigma light yellow, nervures colourless; marginal cell nearly squarely truncate, the post-stigmatal portion longest, but not greatly so; second s. m. large; third discoidal distinct; legs black or piceous, with much light hair, the knees more or less yellowish; abdomen broad, brown-black, with straight chrome-yellow bands, very slightly interrupted in

the middle on segments 1 to 4, those on 3 and 4 abruptly ending some distance from lateral margin; venter brown; claws simple.

Hab. Corpus Christi, Texas, October 20th, 1905; two females (F. C. Pratt). Sent by Mr. Crawford. Probably from flowers of *Helenium*.

Perdita coreopsidis, n. sp.

♀. In my tables (Proc. Phila. Acad.) runs as near to *snowii* as anything, as also does the male. Its appearance is most like *P. mentzeliarum*, but it is very different in detail. The female with spotted abdomen might be considered to run to *P. chamæsarachæ*, but it is not at all like that species.

Length about 6½ mm.; head and thorax brassy green, *very hairy*; vertex dullish, mesothorax shiny; mandibles dull yellow, the apical part ferruginous; labrum dark; face-markings pale rather dull yellow, consisting of a broad band occupying anterior margin of clypeus, and sending a large pointed process upwards in the middle line, and *transversely oblong lateral marks, not at all produced upwards*, nor reaching even the level of top of clypeus; metallic part of clypeus with a strong rosy lustre; scape yellow, with a dark band or streak above; flagellum dark above, dull yellowish beneath and at tip; upper border of prothorax, and tubercles, light yellow; tegulæ yellowish hyaline; wings milky white, nervures and stigma faintly yellowish; marginal cell nearly squarely truncate, its post-stigmatal part considerably the longest; second s. m. large, third discoidal distinct; legs with the apices of anterior and middle femora, and their tibiæ in front, yellow; abdomen broad, rather dull chrome-yellow, with narrow brown-black bands at the apices and bases of the segments, and a large black spot on each side of first, anterior to the band; in a variation the bands are reduced to spots, namely, large transverse subapical subdorsal spots on segments 1 to 4, and smaller, rounder, subbasal lateral spots on 2 to 5. Venter yellow.

♂. Somewhat smaller, with a large subquadrate head, the cheeks with a large blunt protuberance or tooth; face-marks more reduced than in female, being confined to a large pale yellow mark occupying the projecting corners of clypeus, and the linear lateral projection of same, and a very small spot at each lower corner of face; flagellum orange, with some light markings at base above; hind knees (as well as the parts mentioned in female) yellow, and the tarsi yellowish or pallid in front; abdomen with the hind margins of the segments rather broadly whitish hyaline, and the dark colour much increased, occupying all of first segment except a fine yellow streak between it and the hyaline margin, going also a little way up the sides; second segment dark, with a median subapical yellow band, and the posterior lateral corners very broadly yellow; third segment with a broad dark basal band and a pair of spots (in the subdorsal region); fourth and fifth with the base broadly dark; sixth with a broad dark basal triangle; venter yellow, heavily marked with brown. The reduced face-markings, and hyaline hind margins of segments, recall *P. sidæ*, female.

Maxillary palpi 6-jointed; labial palpi 4-jointed, the first joint less than twice length of the others combined, length of second joint 150 μ,

of third 90, of fourth 120—these measurements from a male; claws of female simple, front claws of male cleft; mandibles of female greatly broadened, except the falcate apex. The claws are those of *Cockerellia*.

Hab. Cotulla, Texas, May 5th, 1905, at flowers of *Coreopsis cardaminefolia* (DC.); two of each sex (W. D. Pierce). Sent by Mr. Crawford.

(To be continued.)

NOCTUÆ IN HUNTINGDONSHIRE, 1905, AND A SEQUEL IN THE HIGH COURT OF CHANCERY.

By G. Lissant Cox & Justin Brooke.

During last year's beautiful summer the writers spent an all too short holiday of eighteen days—namely, from June 17th to July 4th—collecting in various parts of Huntingdonshire.

We concentrated our efforts almost entirely on the Noctuæ, and in this brief time either captured or observed no less than seventy-one species. This large number was mainly due to the extraordinary attractions of sugar. Our red-letter day was June 27th, when the average number per tree was one hundred and fifty, and the limits of belief are almost reached when one of us, on a small oak, counted two hundred and eighty insects. Truly an *embarras de richesses!* The entire treacle-patch would be covered, while a jostling crowd carpeted the ground and herbage at the foot of every tree. Still more wonderful, perhaps, was the fact that many moths would fly wildly around and around the sugarer, when, only shortly after sunset, the night's round was being prepared. A few actually committed suicide by flying right into the tin!

This attraction showed an interesting gradual increase from June 17th to the 27th, and then an almost uniform decrease. By July 19th only as many units were seen as thousands a month previously. There were no aphides till July.

In Mr. A. E. Gibbs's interesting article on "The Insects of the Cornish Coast" (*ante*, p. 4) it appears that sugar was very attractive in Cornwall, and that *Agrotis exclamationis* was by far the commonest insect at the end of June. This was also our experience in Huntingdonshire, where this insect came to sugar in almost incredible numbers.

We had intended to take a continuous series of readings during each night from a wet and dry bulb thermometer. We were, however, but two instead of four, and our good resolutions fell through. We did note the temperature before we set out, and after coming home, but, unfortunately for accurate work,

these readings are at different times. Still these, together with a brief description of the day and night weather, and the varying results, have been duly tabulated, and may be of some interest. It will be seen that our best takes (June 27th and 29th) were with a north-east wind, a cloudy sky, and a night temperature of not less than 56° F. In explanation of the words "good" and "bad," it should be stated that they refer to the gross number of insects attracted, and not to their rarity (see p. 130).

As our captures included such species as *Hadena atriplicis*, *Dicycla oo* and its var. *renago*, *Toxocampa pastinum*, *Acidalia rubiginata* (*rubricata*), &c., a few remarks on these and other species may be worth recording.

Cymatophora octogesima.—Three examples came to sugar on three separate nights. One was boxed at 1.10 a.m. on the 22nd, when but six insects altogether were seen at treacle.

C. or.—This occurred sparingly during our visit.

C. duplaris.—Two worn specimens on July 2nd.

Acronycta leporina.—Our first capture came at midnight on June 20th, and settled on the glass front of our forty-candle power acetylene lamp! Two were taken at sugar about 9.15 p.m. Two are of the ordinary light form; the third is dusted with dark grey.

A. ligustri.—We took four. Two are the dark "var. *coronula*."

Xylophasia sublustris and *X. hepatica*.—These two species were fairly common, particularly the first named.

X. monoglypha.—Three very dark—and one absolutely black—specimens were obtained.

Neuria reticulata.—This came to light and sugar; about twelve in all.

Apamea gemina.—This insect came next in point of numbers to *A. exclamationis*. About one in ten was the var. *remissa*.

A. unanimis.—Occurred sparingly.

Agrotis exclamationis.—This occurred in tens of thousands, as noted above. We secured some nice varieties—practically every one figured in Barrett—but still, considering the numbers, the insect varied wonderfully little.

A. obscura (*ravida*).—Three perfect examples were secured at sugar on July 2nd, 3rd, and 4th.

Dicycla oo.—This first came to sugar on July 3rd. Four males and one female. Next day (our last) we sugared an immense area, and only obtained eight. One of these was the var. *renago*. [On July 11th five worn specimens were taken by Mr. R. Brooke, and three ditto on the 17th by Mr. T. P. Gardner. On the 19th they appeared to be over.] This erratic species appears to be maintaining its reputation. The numbers taken from this locality, according to our present knowledge, are, roughly:—1902, two hundred (Entom. xxxvi. 14); 1903, twenty; 1904, one (Entom. xxxvii. 214); 1905, twenty-one. This is the only *Noctua* captured which is not in 'The Fenland' list. It surely must have been very much scarcer formerly to have escaped the notice of even the late Mr. F. Bond. Is it not a fact that the var. *renago* is mainly, if not entirely, confined to be counties of Northampton [illegible]?

Aplecta prasina and *A. advena*.—Common, especially the latter.

Hadena atriplicis.—We took but two of this most lovely insect. The first was a freshly-emerged female, which came to sugar at daybreak on June 21st. On the 25th a male, also just out, was secured at sugar, this time fairly early in the evening.

Chariclea umbra.—Three were secured on our last two nights.

Toxocampa pastinum.—We were again fortunate to find a locality for this species. In two nights (June 30th and July 2nd) we took thirty-four perfect specimens. Thirteen of these came to sugar. This habit must be unusual, since Barrett, vol. v. p. 258, says: "So far as I know, is totally insensible to the attractions of sugar." They flew at early dusk, as well as later in the evening, and many were taken without the aid of a lantern. Some females were captured at rest on their food-plant.

Of the few Geometridæ noted, brief mention should be made of *Acidalia rubiginata*. This insect came singly to light on two different nights. This may possibly be a new record for Huntingdonshire, as but one specimen is recorded from Wisbech, Cambs, in 'The Fenland' list.

The following is the complete list of Noctuæ seen or taken in the eighteen days:—*Thyatira batis, T. derasa, Cymatophora octogesima, C. or, C. duplaris, Bryophila perla, Acronycta psi, A. leporina, A. megacephala, A. ligustri, Leucania conigera, L. lithargyria, L. impudens, L. comma, L. pallens, Axylia putris, Xylophasia lithoxylea, X. sublustris, X. monoglypha, X. hepatica, Neuria reticulata, Mamestra brassicæ, M. persicariæ, Apamea basilinea, A. gemina, A. unanimis, Miana strigilis, M. fasciuncula, M. arcuosa, Grammesia trigrammica, Caradrina taraxaci, Rusina tenebrosa, Agrotis segetum, A. exclamationis, A. corticea, A. strigula, A. obscura, Noctua augur, N. plecta, N. c-nigrum, N. triangulum, N. brunnea, N. festiva, Triphæna fimbria, T. orbona, T. pronuba, Mania typica, M. maura, Dicycla oo, Calymnia trapezina, Hecatera serena, Euplexia lucipara, Phlogophora meticulosa, Aplecta prasina, A. nebulosa, A. advena, Epunda viminalis, Hadena dentina, H. atriplicis, H. thalassina, H. oleracea, H. pisi, Cucullia umbratica, Gonoptera libatrix, Plusia chrysitis, P. gamma, Chariclea umbra, Acontia luctuosa, Euclidia mi, Toxocampa pastinum.*

The sequel, adverted to above, as reported in the 'Daily Graphic,' March 30th and 31st, 1906 :—

Mr. John Ashton Fielden, owner of the Holme Wood Estate, Holme, Huntingdonshire, sued for an injunction in the High Court yesterday to restrain Messrs. George Lissant Cox, Rupert Brooke, Neville Brooke, and Justin Brooke from trespassing on his property. Mr. Rawlinson, K.C., for the plaintiff, said part of Mr. Fielden's estate consisted of a very valuable game preserve, which was drained land from an old mere. It covered some two hundred or three hundred acres, and was so valuable for sporting purposes that as many as from four hundred to six hundred pheasants had been "bagged" in a day.

June, 1905.	Temp.		Weather.		Sugar.	Light.	Remarks.
	Dry bulb.	Wet bulb.	During day.	During night.			
18, 7.45 p.m. 18, 11 p.m.	56° 49°	53° 48·5°	Dull till 2 p.m., then hot sun; wind moderate S.W.	Clear moonlight; heavy dew; no wind.	Bad.	—	
19, 7 p.m. 20, 2 a.m.	62° 54°	56° 53°	Showery; wind moderate S.W.	Clear moonlight from 11 p.m.; no dew; no wind.	Good.	Good.	
20, 7 p.m. 21, 4 a.m.	63° 56°	58° 55°	Dull; some rain; stiff S.W. wind.	Cloudy, stiff S.W.	Good.	Bad.	Most came to sugar at dawn. Note high temperature.
21, 7.30 p.m. 22, 3 a.m.	64° 51°	60° 50°	Dull till noon; cleared; sunshine; wind moderate N.W.	Clear; heavy dew and mist; no wind.	Bad.	Bad.	
22, 6 p.m. 23, 2 a.m.	67° 50°	63° 49°	Hot sun; wind N.W.	Clear; dew and thick mist; no wind.	Good.	Good.	Note different results on apparently similar days.
23, 6 p.m. 24, 12.30 a.m.	63° 50°	57° 49°	Hot sun; wind N.E.	At 10 p.m. clouded over from N.E.; cold wind, slight, and misty.	Bad.	Very bad.	This mist was reported as coming off the North Sea; not one insect to light.
24, 8 p.m. 25, 1 a.m.	57° 51°	56° 50°	Dull till midday, then sunny; wind N.E.	Mist came on again, only thicker; no dew; stiff N.E. wind.	Very good.	—	Note difference to previous night.
25, 7.30 p.m. 26, 4.30 a.m.	64° 51°	57° 50°	Warm and sunny; wind N.E.	Clouded over at 8 p.m. from N.E., but no mist; stiff N.E. all night; very dark.	Bad.	Very good.	
26, 10.30 p.m.	56°	55°	Dull till noon, then sun; N.E.	Thick mist; no wind.	Good.	—	
28, 1 a.m.	57°	56°	Hot, sunny; thunderstorm near by in afternoon; wind W.	Thunder all round, but gradually cleared; no dew; warm west wind.	Very good; average 150 per tree.	—	The record night.
29, 3 a.m.	53°	53°	Hot, sunny; wind W.; thunder 7 p.m.	Some thunder; rain, then cool, clear, and calm; thick mist.	Good.	Very bad.	
29, 7 p.m. 30, 4 a.m.	63° 56°	60° 55°	Dull; wind N.E.	Cloudy, some rain, slight N.E. wind; very dark and close.	Very good.	Very good.	Record night for light.

In the spring of last year the pheasants were sitting in the covers, and on June 19th the defendants came down into the neighbourhood. They erected a sheet on the roadway at night, and displayed lanterns for the purpose of catching moths and other insects. The reclaimed land was famed for its valuable insect specimens. The defendants were warned by the keeper on the first evening that the surrounding covers were preserves, and they were told to be exceedingly careful not to disturb the pheasants. They said they understood, and remained in the roadway, where they had a right to be. They stayed in the neighbourhood for about ten or twelve days, when the keepers warned them that they were doing what they were not entitled to do. Of course they had a right to walk on the high road.

Mr. Buckmaster, K.C. (for the defendants): But must not sit down. (Laughter.)

Mr. Rawlinson: Well, to put it strictly, they must not.

Mr. Buckmaster: What happens if you are tired?—I do not know, but you must not sit down. What would you do?

Mr. Rawlinson: Well, I should go to the nearest licensed house. (Laughter.)

Continuing, counsel said the defendants were told to take their sheets down, and on the Sunday night the keepers saw two of them go on to the railway embankment, over which the plaintiff had sporting rights. They went wandering about, swinging lanterns in the covers, where also it was found that they had placed "sticky stuff" on the barks of trees. It did not, said counsel, seem a great deal to complain of, but such conduct would seriously injure a sporting estate, while there was also the risk of a big fire. Apparently these defendants came down to spend a holiday in the neighbourhood. When spoken to, they said they intended to return in the following year and bring a caravan. (Laughter.)

Mr. Justice Buckley: What are these defendants?

Counsel replied that one was an undergraduate, and one a medical student. Two of them were under age. The plaintiff was claiming an injunction and damages.

Mr. Buckmaster: Are you asking for an inquiry into the number of butterflies which were caught?

Mr. Rawlinson said there was nothing about an inquiry. These young men had tendered a shilling in satisfaction of any damage done, but of course that was not satisfaction. It had been determined long ago that a game-preserver was entitled to substantial damages against persons who, after warning, trespassed on his property. There was one case decided where £500 damages were given, although there was not a single farthingsworth of damage done.

Jackson, one of the plaintiff's keepers, said he ran after the boys (the defendants) with his stick uplifted, but not with the intention of striking them. He always went about carrying his stick up.

Mr. Buckmaster: So that it is handy for striking if you come across a poacher. (Laughter.)

Mr. George Lissant Cox, one of the defendants, denied that he had committed any act of trespass on the plaintiff's land, or disturbed the game. In July last year, when he was in Huntingdonshire, he was a medical student.

Cross-examined: They had five lamps between them, and he thought they had a right to do as they had on the roadside. At first it was his intention to write to Mr. Fielden for permission to go on his land, but he did not do so because he thought permission would be refused. (Laughter.)

Mr. Rupert Brooke, another of the defendants, said he and his two brothers (who were also defendants) were the sons of Mr. Arthur Brooke, J.P., of South Kensington and Dorking. Except for going once on to the roadside and once into the plaintiff's covert one night they had never trespassed or committed any damage.

Cross-examined by Mr. Rawlinson: What is the sticky stuff you used?—Treacle. (Laughter.)

The Judge: Perhaps you are asking this for ulterior purposes. (Laughter.)

Mr. Rawlinson replied he knew nothing of moths, but confined himself to partridges.

Other evidence was called.

Mr. Buckmaster submitted that the action was a frivolous, vexatious, and contemptible one, and asked the judge to dismiss it.

Mr. Rawlinson pointed out for the plaintiff that a landlord was entitled to his rights, and was perfectly entitled to preserve his land from any sort of trespass.

The Judge, having reviewed the evidence of the alleged trespass by the four boys, said he thought it was not a case for an injunction. They had no intention of infringing anybody's rights. There was also a claim for damages. There was no evidence whatever that any damage was done. In the circumstances it seemed to be an oppressive action. He would make an order for the payment of the shilling out of court to the plaintiff, which had been paid in by the defendants, but the plaintiff would have to pay the defendants' costs.

Royal Infirmary, Liverpool. Emmanuel College, Cambridge.

LIFE-HISTORY OF *APORIA CRATÆGI*.

By F. W. Frohawk, F.E.S., M.B.O.U.

Wishing to see *Aporia cratægi* in a wild state, and being anxious to capture females for the purpose of working out its life-history, my friend, Mr. F. G. Cannon, and I, during July, 1903, purposely visited a certain locality in Kent, which is the home of this fine insect. On the 12th, 13th, and 14th of that month we had pleasure in finding several, both at rest and on the wing, and captured several in very perfect condition. Clover fields appeared particularly attractive as resting places. Many we saw rise from the clover (not in bloom) when the sun shone; we also found them at rest on ears of corn, and upon the blossoms of both red and white clover. Sometimes, while resting on clover leaves, they are very conspicuous, and can easily be detected at a distance of one hundred and fifty and two hundred

yards. On the evening of the 13th I found a pair at rest on a large red clover blossom; they had evidently paired, as the female was in very fresh condition. This one I kept for eggs, and placed her on a plum-tree on the 15th, and two other females I turned on a young plum tree covered over with gauze. On the following day there was but little sunshine, consequently no eggs were laid, but the next day (17th), being warm and sunny, the two females on the small tree deposited three batches of eggs, one batch on the upper side, and the two other batches on the under side of the leaves. The leaf containing the smallest batch I removed for examination. Before putting the butterflies on the trees I fed them with sugar and water, which they drank freely; one continued sucking at the liquid for half-an-hour. I also fed them daily when on the trees.

On the 23rd another batch of eggs deposited on the upper surface of a leaf, and a smaller batch on the under side of another leaf on the following day. Owing to the continuance of cold, dull, wet weather, with only a very slight amount of sunshine, and that chiefly during early morning, they all remained quiet day after day Two died during the first week of August, and the last one died on the 9th August, without depositing any eggs,—this one being that which I found at rest on clover on July 13th, obviously the day it emerged; she, therefore, lived for twenty-seven days, which, probably, is about the duration of life of this species in the perfect state. I may here mention that fields of broad beans and lucerne in bloom are very attractive; the honey-dew on the bean leaves seems the greatest attraction, not only to *A. cratægi*, but to the common Whites as well. Owing to the larvæ dying during hybernation, I again visited the same locality in July, 1904, but found this species much scarcer than in the previous year; however, I captured five more females on the 5th and 6th of that month. These I placed on a small plum-tree on the morning of the 8th; by midday two batches of eggs were deposited, and another batch on the 9th. (The tree, growing in a large flower-pot, was sunk in the earth from July 8th until March 23rd following, when I removed it indoors for examination, and placed it by a window facing north-east exposed to early morning sun). The eggs hatched on August 1st, remaining in the egg state twenty-three days. Respecting the five batches of eggs laid July, 1903; the small batch, consisting of about one hundred ova deposited July 17th, remained, without changing colour, until August 8th, when they became duller on the crown, and on the following day they assumed an olive or greenish ochreous hue, and dark on the crown; during the night they commenced hatching, and all were hatched by early morning on the 10th. They remained all that day clustered together upon the empty egg-shells, but in the evening they gradually moved off. These likewise were twenty-three days in the egg.

As the weather remained so cold and wet, and fearing the other batches out-of-doors would not hatch, I moved another lot indoors on August 20th. The following day they showed signs of changing colour, and these also began hatching on the night of the 23rd, and by the next evening all were hatched. Another batch left on the tree out-of-doors changed colour on the 24th, and hatched on the 26th. The two remaining batches hatched during the first week in September.

The egg measures $\frac{1}{27}$ in. high, and $\frac{1}{50}$ in. across the middle, its greatest diameter; in shape it resembles a rather elongated acorn; the micropyle is flat and smooth, there are usually fifteen, but sometimes sixteen, longitudinal keels, seven running from near the base to the summit, where each terminates in a glassy globe enveloping an opaque white knob; the remaining keels are simple at the ends, disappearing into the surface by the base of the globes; the spaces between the keels are angular, and very faintly ribbed transversely. The colour when first laid is a bright, rich, primrose-yellow, and remains unchanged until a day or two before hatching, as above described. They are deposited in rows closely packed, and stand erect.

I think in a state of nature they would usually be deposited on the under surface of the leaves, otherwise heavy rains would be likely to dislodge them, as I find they are easily removed with a finely-pointed wet sable-hair brush.

Directly after emerging from the egg the larvæ measures $\frac{1}{18}$ in. long; the body is cylindrical, of uniform thickness, and wrinkled transversely; on the upper half the segmental divisions are clearly defined; there are three longitudinal rows of long fine white hairs on each side above the spiracles, each having a large bulbous base, and one immediately below the spiracle having a flatter base; the anterior dorsal ones on each segment curve forwards; the posterior one is shorter and straight, and the subspiracular one curves downwards, all have slightly knobbed and clefted tips. On the ventral surface, including the claspers and legs, are simple white hairs; the spiracles are brown and shining. The entire surface is densely sprinkled with minute dusky points, giving it a rough texture. The body (including the claspers) is pale ochreous yellow, the legs dusky, and the head shining black, with a granular surface, pale olive-brown eye-spots, and beset with about twenty fine whitish hairs, and a pair of very small black bristles in the centre.

After leaving the egg-shells, which are considerably eaten, they spin a web over the surface of the leaf, living gregariously, all feeding upon the same part of the leaf. For the first twelve days they live exposed upon and under a slight covering of web, they then spin a denser web, and all retire within it. The first moult occurred on or about August23rd.

On August 24th a few emerged from the web, and feed on the

upper cuticle of the leaf, over which a thin layer of silk is spun in connection with the silken nest, into which they retreat and rest after feeding; only a few emerge at the time to feed.

Shortly after the first moult it measures $\frac{1}{8}$ in. long. The head is large, black, and shining. On the first segment is a black, chitinous band, and a black chitinous disc covering the dorsal surface of the last segment, resembling the head. The ground colour is an olive-yellow; the surface is sprinkled with minute black points and numerous long and short fine silky white hairs; some are very long and curved. The body is striped longitudinally with brownish on the dorsal surface; one stripe being mediodorsal, the others sub-dorsal. The ground colour of the spiracular region is greyish, with a very fine longitudinal brown spiracular line; the spiracles are black. If disturbed they crawl rapidly, and retreat backwards like a micro-larva. When fifteen days old it measures $\frac{1}{6}$ in. long.

The larvæ from the first batch of eggs, which hatched on August 9th, moulted the second time on September 2nd; others moulted during September. It is in this stage after the second moult that they hybernate.

They feed in relays, numbering about one or two dozen individuals, at a time; they march out of the nest together, and feed in a row side by side, feeding on the cuticle of the leaf, and retire in a body within the nest, formed of a dense silken web spun between the leaves. Many continued feeding until the third week in October, when all entered into hybernation. They hybernate in batches in separate compartments varying in size, and often woven side by side in the interior of the nest, which is a tough, dense, silken mass of a greyish colour, spun over the remaining parts of the leaves upon which they fed, and around the branches, generally between a small fork. On February 16th, 1904, I examined one of the hybernaculums, and found upon cutting open one of the compartments, a little party of larvæ huddled together, the long, soft hair of their bodies intermingling gives them the appearance of being enveloped in down; this, coupled with the density of the wall of the compartment and the massive outer covering of web, affords them great protection against cold and damp, the whole combined forming a very secure and snug abode.

On March 24th, 1905, three larvæ crawled out of one of the hybernaculums, and rested on the outside of the web, followed the next day by others.

On the 26th, a bright sunny day, several emerged from different nests, and fed on the expanding buds, retreating into the webs after feeding. On the 24th I put a few upon a sprig of plum bearing tender young leaves, and by the following day they had fed a little; the next morning I found them feeding

on the base of the leaf upon which they rested, in company similar to before hybernating.

Directly after emerging from hybernation, and after second moult, they are very small, only measuring $\frac{1}{6}$ in. long, and similar in all respects to previous stage, excepting the hairs are longer, forming a somewhat dense covering.

Just before third moult it measures $\frac{1}{4}$ in. long.

First one moulted, third time, April 9th, 1905, others continued moulting during the next few days.

After third moult, and a few days before fourth moult, it measures $\frac{5}{8}$ in. long. The body is nearly cylindrical, and transversely wrinkled; the dorsal surface is black, with a sub-dorsal longitudinal band, composed of orange blotches and speckles, which cuts up the black into three stripes; the sides and ventral surface are olive-drab, minutely speckled with pale ochreous; on the dorsal surface are numerous slender bright orange hairs, and longer silky pure white ones scattered over the body, as well as a large number of shorter ones; all the hairs have shining, black, bulbous bases, each encircled by an ochreous ring; the head and legs are black, the former beset with hairs.

They rest together in compact parties, dispersing to feed each time, and strip the twigs, leaving only the midribs of the leaves, beginning first on the leaves at the end of the branches and feeding downwards, returning to the tips to rest, and spinning webs each journey, backwards and forwards, forming a carpet of silk over the branches along which they travel.

First one moulted the fourth time April 21st, and all passed through this moult by the end of that month. After fourth and last moult, fully grown, about two hundred and eighty days old, the larva measures from $1\frac{1}{4}$ in. to $1\frac{3}{8}$ in. long. During this last stage it increases greatly in size, being only $\frac{5}{8}$ in. long when first moulted, and the skin is rough and ample, which becomes stretched and shining when fully grown. In shape it is almost cylindrical, but slightly attenuated at each end. The dorsal surface is black, with a sub-dorsal, longitudinal, ochreous-orange band, composed of numerous speckles; in the centre of each rises a fine hair, with a tiny black shining bulbous base; all the hairs, excepting the white ones, are either orange or amber, while the black surface is very finely granulated and sprinkled with shorter and very fine black hairs, and a few long wavy white ones, with an ochreous ring encircling the base of each; the whole surface below the sub-dorsal black band is very glossy, of a purplish grey colour, thickly sprinkled with whitish grey spots, each encircling a fine white hair, the entire surface of the body being hairy; the head is dull black and covered with black hairs; the anal segment, including the claspers, is also black, the other claspers are unicolorous with the body; the legs and spiracles are shining black.

They rest stretched out along the twigs, often in small companies, lying side by side, always spinning silk over the branches and leaves. Occasionally I found one suspended, hanging by a web. If touched several times they suddenly start crawling rapidly; they neither feign death nor roll in a ring.

I found before hybernation several had fed on a laurel leaf which had come in contact with the plum branch upon which they were; they ate a large part of the upper cuticle of the leaf. I therefore tried a few larvæ in the last stage with laurel, and although they fed on some of the young leaves, it caused them to vomit, and one died. Plum appears to be mostly appreciated, and forms the chief food in a wild state.

The first larva spun up for pupating early morning of May 14th, 1905, and pupated mid-day on the 16th, the transformation occupying about fifty-five hours. All the remaining pupated during the next week.

Three of the larvæ when about ¾ in. long produced ichneumons (*Apanteles*) in a similar manner as they infest *Pieris brassicæ*, emerging in clusters, and spinning lemon-yellow cocoons over the body of the host, after which the latter gradually dies. Three more larger ones, and another full grown, produced ichneumons on May 20th. The ichneumon apparently deposited its eggs in the larvæ in the previous autumn, as a few occasionally crept through the gauze covering the tree, and rested outside for a time, when undoubtedly they were discovered by the parasite.

The pupa averages 1 in. in length; the head is knobbed in front; at the base of the antenna is a short sharply-pointed spike; the meso-thorax is swollen, and keeled dorsally; the waist sunken, a slight abdominal dorsal keel; the base of the wings angular; on the second, third, and fourth abdominal segments is a lateral keel; the tongue-case protrudes beyond the antennæ, and is detached, forming a spike; the anal segment terminates in a flattened, slightly-curved horn, bearing the cremastral hooks, which are firmly attached to an ample pad of silk, and a girdle of silk passes round the body at the waist. The normal ground colour is a pale greenish yellow of more or less intensity, some approaching a greenish whitish; a black stripe passes over the crown and thoracic keel, and a broad black band runs along the ventral surface, including the antennæ, tongue, legs, and costal margins of the wings, only being broken up at the base of the legs by the ground colour and yellow eye-spots. The wings are broadly margined with black, and black vandyke markings on the inner edge of hind margin; a row of five black spots form a median band, and usually there are one or two small discoidal spots; the spiracles are black, and surrounded by conspicuous black markings; on each segment is a dorsal anterior black spot, and three sub-dorsal smaller ones, and two

super-spiracular larger ones, these all form longitudinal rows. The thorax is also spotted with black; the frontal knob, dorsal and lateral keels, as well as two spots on the prothorax and a spot at the base of the wings and anal extremity, are all yellow. The whole surface is irrorated, and, excepting the wings, it is sprinkled with very fine extremely minute hairs. The ground colour is liable to vary as well as the size of black markings. Those that pupated in coloured boxes (which I put the larvæ in when ready to pupate) were affected by certain colours, as those in yellow produced decidedly yellow pupæ; blue and green had the same effect of producing green pupæ, those on black and grey surfaces became greyer, and those on white whiter.

During June, 1905, forty-eight perfect imagines emerged.

NOTES AND OBSERVATIONS.

A New Preventive of Gnat-bites.—All those who study natural history in the field must have felt the want of a good preparation to repel the attacks of flies, gnats, and midges, which in many localities often make collecting anything but a pleasure. Two or three seasons ago the writer discovered a substance which is thoroughly efficacious, and quite harmless to a sensitive skin, besides possessing an odour rather pleasant than otherwise. Several medical friends and other entomologists have used this, and are united in its praise; sometimes we have even taken a siesta on a hot afternoon where flies were swarming, without having been annoyed or even disturbed by them. In boggy woods, such as the Lancashire mosses, where biting gnats &c., abound, it is best to rub a little of the liquid upon the exposed parts of the skin *before* going into the wood; but for day flies, such as the larger Diptera, it is often sufficient to sprinkle a little upon the cap. The feeling with which one sees a voracious gadfly or "cleg" come charging down, only hurriedly to change his course when the aroma strikes him, is, to say the least, very gratifying. Being of the nature of a slowly volatile essential oil, the liquid does not damage one's clothing in any way; under the registered title, "Terrifly," it is packed in a bottle convenient for the pocket, and containing about sufficient for a season. Further particulars will be found on the advertisement page.—Wm. Mansbridge; Liverpool.

Larvæ of A. contiguaria.—When larvæ-hunting in North Wales at Easter, I was very pleased to find ten larvæ of *A. contiguaria*, feeding on *Cotyledon umbilicus*, among heather, in a very sheltered corner on the rocks. Though I have searched carefully for the past five or six years for this larva, I have never before been able to discover it feeding either by day or night; nor do I remember to have seen any record of its capture. It has been bred in odd specimens from a miscellaneous lot of larvæ, but not identified until the perfect insect emerged.—Robert Tait, Jr.; Roseneath, Ashton-on-Mersey, Cheshire.

Brief Note on Hawaiian Butterflies.—Meyrick incorrectly writes the name of our native Vanessid "*Vanessa tammeamea*" (1899 Fauna

Haw.); the figure in Kotzebue's 'Reise' (iii. pl. v. figs. 8 *a and b*) was, indeed, so lettered, but the orthography, *tameamea*, attached to the Eschscholtz's description (p. 207) ought to stand. The spelling in any case is unfortunate, as the butterfly is named from Kamehameha I. the first Hawaiian "Over-lord"; *t* and *k* are local variants, but the omission of the "h's" completely alters the meaning. *Anosia erippus* and *Pyrameis atalanta*, *cardui*, and *huntera* occur in Oahu, though not recorded from there by Meyrick, who omits mention altogether of *Pieris rapæ*, introduced some years since on cabbages imported from San Francisco, and now fairly common in Oahu, Hawaii, &c.—G. W. Kirkaldy.

The Entomological Club.—A meeting was held on May 18th last, at Wellfield, Lingards Road, Lewisham, the residence of Mr. Robert Adkin, the host and chairman of the evening. Other members present were Messrs. Donisthorpe, Porritt, and Verrall, and besides these there were ten visitors.

Erratum.—In the April number of the 'Entomologist' I recorded, among other insects taken in Hertfordshire, the capture of *Xylophasia scolopacina* at Hitchin, on the authority of Mr. A. H. Foster, of that town. Mr. Foster's insect has since been identified as a variety of *Apamea didyma*.—A. E. Gibbs; St. Alban's.

CAPTURES AND FIELD REPORTS.

Larvæ in North Wales at Easter, 1906.—Hybernating larvæ were very backward, but fairly plentiful, especially *Agrotis agathina*, *Epunda lichenea*, and *Boarmia repandata*. Larvæ of *Agrotis ashworthii* were not so freely obtained as last year, but they pupated more satisfactorily than they have done for some years, quite ninety per cent. having gone down successfully.—Robert Tait, Jun.; Roseneath, Ashton-on-Mersey, Cheshire.

Dasycampa rubiginea at Light.—I captured a specimen of *D. rubiginea* at light on April 11th last.—F. Pope; Weirfield Road, Exeter.

Eupithecia consignata in Hampshire.—On May 24th, 1906, I boxed a "pug" resting on the bark of a small hawthorn tree, in a hedge by the roadside at Hayling Island. It proved to be a female *Eupithecia consignata* in fine condition, and will, I hope, oblige with a nice batch of ova, as she has already deposited thirteen eggs.—Alfred E. Tonge; Anicroft, Reigate, May 26th, 1906.

Field Work in 1905.—Most of the work done in 1905 consisted in night collecting in the cultivated fens, and an occasional evening in the neighbouring Huntingdonshire woods; as a natural result most of the insects taken were Noctuæ. Light and sugar were the means of capture most employed, except when the flowers of various grasses, and later of the common reed, proved more attractive.

January.—Five *Cucullia verbasci* forced out; two *Phigalia pilosaria* emerged.

March.—*Hybernia marginaria*, very common, a large percentage

being dark varieties. A little work was done at sallow-blossoms, but only common species were seen, viz., *Pachnobia rubricosa*, *Tæniocampa stabilis*, *T. instabilis*, *T. cruda*, *T. munda*, and *Calocampa exoleta*—the only hybernated species seen.

April.—*Diurnea fagella*, on oaks; several nearly black, and the majority much darker than Northamptonshire specimens taken during the same month. At sallows, in addition to the species above named, *Mamestra brassicæ*, *T. gracilis*, and *T. gothica* were seen.

June.—Sugar was remarkably successful. The localities worked were chiefly the dykes intersecting the ordinary cultivated fen fields, and occasionally the woods mentioned before. Gate-posts and thistle-heads were sugared; the latter only because of the scarcity of posts, for it was very difficult to select the moth required from among the struggling mass of *Agrotis exclamationis*, *A. segetum*, and other common species. The posts were the best, but even on these it was hard to make sure of everything wanted, owing to the endeavours of an attendant host of moths waiting for a chance to force their way on to the sugar. The species obtained in June and the first few days in July were *Thecla pruni*, very local in Hunts, but common where it occurred. *M. arundinis*, nine specimens were taken by the writer and a friend one night at Wicken. One of these is noticeable for its large size in comparison with most of the modern Wicken specimens. *Spilosoma* (*Arctia*) *urticæ*, three specimens at light at Wicken. *Cymatophora ocularis*, one at sugar on poplars. *Leucania straminea*, three specimens; a new record for this district. *L. obsoleta*, appeared in fair numbers; this species, too, we have never noticed here before. *Senta maritima* (*ulvæ*), a few among reeds, but none of any marked variety. *Xylophasia polyodon*, a positive nuisance; in the fen many were of a very dark brown form. *Neuria reticulata* (*saponariæ*), fairly common. *Miana strigilis*, common; nearly all the specimens noticed during the early part of June were var. *æthiops*; later the numbers of type and variety were about equal. *Agrotis exclamationis*, more numerous even than *X. polyodon*, and in great variety, the most striking form being one having the ground colour rather light, and the three stigmata an intense black. *A. corticea*, rare, two specimens of a smoky black colour. *Acidalia emutaria*, plentiful in the fen dykes. *Bapta bimaculata* (*taminata*), common and variable in size. *Cidaria sagittata*, although we see the larva every year in its natural habitat, this is the first time the imago has been taken in flight. *Nascia cilialis*, a few at light at Wicken. *Dioryctria abietella*, one specimen, the only one ever noticed here. This is a curious occurrence, as it was taken in the garden, where there are only one or two old fir-trees, and there is no fir plantation in the district.

August.—Three specimens of *Tapinostola elymi* were taken on the Norfolk sand-hills. At home, one morning's beating produced two larvæ of *Acronycta strigosa*, but nothing else. On the whole, August was the worst month of the year; nothing came to sugar, nor was anything of note obtained in any other way.

September and October.—Reed-heads were more productive than sugar, and the species taken were *Calamia lutosa*, *Agrotis saucia*, *Xanthia cerago*, *X. silago*, and *X. gilvago*, *Cirrhædia xerampelina*, and *Epunda lutulenta*; of the latter the males were largely in excess at

sugar, while at reed-heads the sexes were about equal. *Calocampa vetusta* was also taken. A few full-grown larvæ of *L. obsoleta* were taken hybernating in the reed-stems of the preceding year. One pupa of *Sphinx convolvuli*, which, like most of those we have obtained lately, has not survived.

Among a number of insects kindly collected by a friend in Ireland may be mentioned *X. sublustris*, one specimen of an olive instead of the usual reddish tone, and one of *Ino statices* taken on a mountain-side late in August.

The following is a list of the Macros taken; most of them, except as noticed above, occurred commonly:—*P. machaon*, *C. edusa*, *P. cardui*, *M. galathea*, *T. w-album*, *S. ocellatus*, *M. porcellus*, *C. elpenor*, *C. ligniperda*, *I. statices*, *Z. filipendulæ*, *E. jacobææ*, *S. fuliginosa*, *S. mendica*, *S. lubricepeda*, *S. menthastri*, *O. gonostigma*, *T. cratægi*, *S. carpini*, *E. apiciaria*, *A. prunaria*, *S. illunaria*, *O. bidentata*, *E. alniaria*, *B. hirtaria*, *I. vernaria*, *P. bajularia*, *E. omicronaria*, *H. auroraria*, *A. luteata*, *E. heparata*, *A. scutulata*, *A. bisetata*, *A. immutata*, *A. emutaria*, *B. taminata*, *P. petraria*, *A. æscularia*, *O. dilutata*, *L. didymata*, *E. alchemillata*, *E. decolorata*, *E. centaureata*, *E. succenturiata*, *E. subfulvata*, *E. pygmæata*, *E. vulgata*, *E. exiguata*, *E. rectangulata*, *Y. impluviata*, *M. albicillata*, *M. montanata*, *M. fluctuata*, *A. rubidata*, *A. badiata*, *A. derivata*, *C. ferrugata*, *C. unidentaria*, *C. bilineata*, *P. tersata*, *P. vitalbata*. *S. dubitata*, *S. vetulata*, *S. certata*, *C. miata*, *C. sagittata*, *C. immanata*, *C. testata*, *C. populata*, *C. fulvata*, *C. pyraliata*, *C. dotata*, *P. comitata*, *E. mensuraria*, *P. falcula*, *P. unguicula*, *C. spinula*, *T. derasa*, *B. glandifera* var. *impar*, *B. perla*, *A. psi*, *A. aceris*, *A. megacephala*, *S. venosa*, *L. conigera*, *L. lithargyria*, *L. pudorina*, *L. comma*, *L. impura*, *L. pallens*, *C. despecta*, *T. fulva*, *N. typhæ*, *G. flavago*, *H. micacea*, *A. putris*, *X. lithoxylea*, *X. polyodon*, *X. hepatica*, *D. pinastri*, *H. popularis*, *L. testacea*, *M. anceps*, *M. brassicæ*, *M. persicariæ*, *A. gemina*, *A. unanimis*, *A. fibrosa*, *A. oculea*, *M. strigilis*, *M. fasciuncula*, *M. literosa*, *M. furuncula*, *M. arcuosa*, *G. trilinea*, *C. morpheus*, *C. alsines*, *C. blanda*, *C. cubicularis*, *R. tenebrosa*, *A. suffusa*, *A. saucia*, *A. segetum*, *A. exclamationis*, *A. corticea*, *A. nigricans*, *A. ravida*, *A. tritici*, *T. orbona*, *T. pronuba*, *N. augur*, *N. plecta*, *N. triangulum*, *N. brunnea*, *N. festiva*, *N. rubi*, *N. umbrosa*, *N. xanthographa*, *P. rubricosa*, *T. gothica*, *T. instabilis*, *T. stabilis*, *T. gracilis*, *T. munda*, *T. cruda*, *O. ypsilon*, *A. pistacina*, *A. lunosa*, *X. cerago*, *X. silago*, *X. gilvago*, *X. ferruginea*, *C. xerampelina*, *C. diffinis*, *D. capsincola*, *H. serena*, *P. flavicincta*, *E. lutulenta*, *M. oxyacanthæ*, *P. meticulosa*, *E. lucipara*, *A. herbida*, *A. nebulosa*, *A. advena*, *H. adusta*, *H. protea*, *H. dentina*, *H. chenopodii*, *H. suasa*, *H. oleracea*, *H. pisi*, *H. genistæ*, *C. vetusta*, *C. exoleta*, *C. verbasci*, *C. umbratica*, *E. fuscula*, *B. argentula*, *P. chrysitis*, *P. festucæ*, *P. iota*, *P. gamma*, *G. libatrix*, *A. tragopogonis*, *M. typica*, *C. nupta*, *E. mi*, *H. rostralis*, *R. sericealis*, *H. grisealis*, *H. cribralis*, *P. fimbrialis*, *P. farinalis*, *P. glaucinalis*, *A. pinguinalis*, *A. cuprealis*, *P. purpuralis*, *H. cespitalis*, *N. cilialis*, *C. lemnalis*, *P. stratiotalis*, *H. stagnalis*, *H. nymphealis*, *B. fuscalis*, *E. crocealis*, *S. lutealis*, *S. olivalis*, *S. prunalis*, *S. hybridalis*, *S. pallida*, *S. forficellus*, *M. cribrella*, *H. saxicola*, *E. elutella*, *D. abietella*, *R. advenella*, *O. ahenella*.—J. C. and H. F. Fryer; Caius College, Cambridge.

SOCIETIES.

South London Entomological and Natural History Society.—*March 8th.*—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. R. Adkin exhibited pupa-cases, *in situ*, of several species of Ægeridæ (Sesiidæ), including *Æ. culiciformis*, *Æ. scoliiformis*, *Æ. asiliformis*, and *Æ. ichneumoniformis*.—Mr. West (Greenwich), thirty species of Hemiptera, which he was presenting to the Society's collections.—Several members remarked on the season. Sallows had been observed in flower as far back as Christmas, and were probably fully out by the first week in March in the south. *Hybernia rupicapraria* was out early in January; *Tæniocampa pulverulenta*, *Asphalia flavicornis*, *Phigalia pedaria*, *Nyssia hispidaria*, and *T. stabilis* were already out; the last-named one was worn.

March 22nd.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. A. Harrison, for Mr. C. Oldham, fine examples of male *Cosmotriche potatoria*, with the pale female coloration.—Mr. F. M. B. Carr, Scotch and South English *A. flavicornis*, showing the former to be generally darker, with more strongly marked bands.—Mr. Hy. J. Turner, *Erebia episodea*, *Physciodes ismeria* and *Satyrus nephele* received from M. A. J. Croker, Redvers, Assiniboia.—Mr. L. W. Newman, short series of *Leucania vitellina* and *Nyssia lappona*, with beautiful and extreme melanic forms of *Tephrosia consonaria* and *Boarmia gemmaria*—Mr. S. Edward, a large number of exotic Lycænidæ.—Mr. R. Adkin, a specimen of *Valeria oleagina*, and discussed the reputed occurrence of the species in Great Britain.—Mr. T. W. Hall, dark form of *Crymodes exulis* from Rannock, with a powdered light form from the Shetland Isles for comparison.—Hy. J. Turner, *Hon. Report Secretary.*

Birmingham Entomological Society.—*202nd Meeting, March 19th.*—Chairman, Mr. G. T. Bethune-Baker, President.—The meeting was held in the Society's new rooms at Avebury House, 55, Newhall Street.—Mr. J. T. Fountain showed a very fine variety of *Phigalia pedaria*. It was practically a black-veined moth, the whole of the ground being almost equally suffused with grey, and the veins and costa being very decidedly darker; it was found at Highbury, near Birmingham.—Mr. R. S. Searle, three specimens of *Borkhausenia* (*Œcophora*) *pseudo-spretella*, found about three inches under ground when pupæ digging.—Mr. J. T. Fountain, a piece of cork, into which a larva of *Acronycta psi* had bored its way and pupated; he thought it was a very unusual habit for the species.—Mr. Gilbert Smith, a log of larch containing *Tetropium crawshayii*, and gave details of its life-history. He said that it feeds only in larch, and only in trees which had just begun to fail. So few trees were in the right condition, at the right time, as a rule, that he thought the beetles must possess some powerful sense to enable them to find them. Mr. C. J. Wainwright suggested that it was perhaps not the fact that the beetles found the right trees, but that they laid their eggs broadcast, and those which were in the right place started new colonies, and the others died away. Mr. E. C. Rossiter said that he thought it was scent, and that, perhaps, when the trees began to fail, some chemical change produced a stronger or different smell. He said that turpentine was very attractive, and that some years ago he had tried a number of experiments in the open air, in Exhibition Road, London, upon turpentine, orange and lemon

oils, &c., and that they had attracted great numbers of moths, including many *Zeuzera pyrina*, which must have come a long way.

April 30th.—The President in the chair.—Mr. R. C. Bradley exhibited a species of *Cheilosia* taken at West Runton in 1900, when he and Mr. Wainwright found it not uncommonly; it had remained unrecognized until now, but Mr. Verrall having sent some of them on to Becher, it was pronounced by him to be *velutina*, a species new to Britain.—Mr. J. T. Fountain, a varied series of local *Hybernia marginaria*, including one remarkably pale specimen, very pale and quite bleached-looking, and somewhat under-sized, taken at King's Heath on April 1st last. The majority were dark, tending towards *fuscata*, which is a common local form.—Mr. J. Simkins also showed *H. marginaria*, including both light and dark forms, from Solihull; also specimens of *Macrothylacia rubi*, which he had succeeded in rearing by forcing. He fed them on oak, hybernated them in moss out of doors, kept them out of doors until January, and after waiting until they had been frozen hard, brought them into a temperature of ninety degrees. In two days they spun up, and in a fortnight emerged. He regarded the freezing before forcing to be an important item in the process. Whilst in the pupal state he teased them with drops of water; they would then work themselves from the bottom to the top of their long cocoons rapidly, but as soon as the annoyance was over would drop quietly and quickly back, in spite of their recurved spines; he wondered how this was managed, whether by chance the spines were in any way retractile.—Mr. H. W. Ellis showed *Amara nitida*, from Knowle, where it is not uncommon, though usually a very rare beetle. —Mr. Gilbert Smith, a number of working drawers of larvæ, &c., of Coleoptera; one showed a very remarkable larva, apparently of a Lamiid beetle, but whereas Lamiid larvæ are quite legless, this showed remarkable rudimentary legs, which was a new feature altogether. Unfortunately the larva was unique and died, but as far as he could tell it appeared to be near to *Mesosa nubila*.—Mr. G. T. Bethune-Baker, a collection of Lepidoptera, made in the Lake District last year. Also two moths which had previously been exhibited by Mr. W. E. Collinge, and described as seriously destructive to cocoa-nut palms in Fiji; they had proved to be new, and to belong to a new genus of the Syntomiidæ.—Colbran J. Wainwright, *Hon. Sec.*

City of London Entomological and Natural History Society.—*April 3rd.*—Mr. L. W. Newman, of Bexley, was elected a member of the Society.—Mr. E. A. Cockayne exhibited *Hybernia leucophæaria*, from Richmond Park, including two melanic specimens; also very dark *Nyssia hispidaria*, from the same locality.—Mr. G. G. C. Hodgson, a cocoon of *Zygæna filipendulæ*, found on a hawthorn bush two feet above the ground.—Mr. W. J. Kaye, a series of *Anticlea badiata*, bred from Surbiton ova, the emergence extending from February 1st to March 22nd, although the larvæ pupated almost simultaneously.—Mr. A. W. Mera male and female hybrids of *Nyssia lapponaria* × *zonaria*; several pairings *inter se* were obtained, but no ova resulted, despite the fact that the females went through the actions of oviposition.—Mr. A. Sich read a paper entitled, "A Contribution to the Study of the Micro-Lepidopterous Fauna of the London District," and laid before the Society a preliminary list of the Micro-lepidoptera of South-west London.

April 17th.—Mr. C. P. Pickett, *Pararge egeria*, third brood, bred August, 1904, and their descendants, which passed the winter as pupæ and emerged in March and April, 1905.—Mr. T. H. Hamling, larvæ of *C. dominula*, from Kingsdown, Kent, where he had also found larvæ of *Liparis chrysorrhœa* plentiful.—S. T. Bell, *Hon. Sec.*

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society. 1905–6. Pp. i–xvi, 1–123. With Plates, Diagrams, and Map. The Society's Rooms, Hibernia Chambers, London Bridge. 1906.

Among the papers of special interest to the entomologist are—"Our British Plume Moths," by Mr. J. W. Tutt; "On the Lengthened Period of the Pupal Stage in sundry Species of Lepidoptera," by Mr. R. Adkin; "The Genus *Eurymus* (*Colias*)," by Mr. H. J. Turner. In the Presidential Address, Mr. Hugh Main refers to the increased attention now given to the early stages of Lepidoptera, and he touches on the Mendelian hypothesis in regard to insects.

There are also among the papers and other contents of this volume a *résumé* of a lecture by Mr. D. J. Scourfield on Mendel's Law of Heredity, and Reports of the Field Meetings held during the year. Mr. Adkin's account of the Seal meeting is accompanied by a map of the district, as well as two plates showing some of the "Chart" scenery; the latter are from photographs taken by Mr. Step.

The Natural History of Selborne. By the Rev. Gilbert White, M.A. Rearranged, classified in subjects by Charles Mosley. Crown 8vo, pp. 266. London: Elliot Stock. 1905.

This popular work was first published in the year 1789, and since that time it has passed through many and various editions. In the present volume the celebrated letters have been arranged under the different subjects to which they refer. Thus in reference to insects (Entomology), the few letters in which various species are mentioned are given in their original sequence, but are arranged under the names of the orders to which the species belong. There is a useful index, and a facsimile reproduction of the original frontispiece.

We have also received the following:—

A Study of the Aquatic Coleoptera and their Surroundings in the Norfolk Broads District. By Frank Balfour Browne. (Reprinted from the 'Transactions of the Norfolk and Norwich Naturalists' Society,' vol. viii.)

Lepidoptera from the Edinburgh (or Forth) District: Further Records. By William Evans. (Reprinted from 'The Annals of Scottish Natural History,' July, 1905.)

Manchester Microscopical Society: Annual Report and Transactions, 1904. Pp. 86. Plates i–iii. Contains a paper dealing with Forest Entomology, entitled "Further Notes on Arboreal Insects," by A. T. Gillanders.

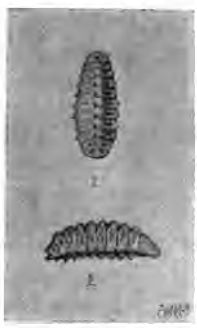
The Cultivation of Silkworms. A Guide to their Rational Treatment, with notes on every species grown in Ceylon. By Percy N. Braine.

ENTOMOLOGIST

JULY, 1906. [No. 518.

ON OF THE LIFE-HISTORY OF *LYCÆNA ARION*.

By F. W. Frohawk, M.B.O.U., F.E.S.



Lycæna arion larva.

INCE July, 1895, I have been endeavouring to complete the istory of *Lycæna arion*, thereby trying to solve the mystery h has hitherto surrounded the last stages of this remark- larva. Notes and descriptions of its earlier stages will be nd in the 'Entomologist,' vol. xxxii. pp. 104–6 (May, 1899); . xxxvi. pp. 57–60 (March, 1903); and in vol. xxxviii. pp. 193–4 ugust, 1905), is the description of the pupa which Mr. A. L. yward and I had the pleasure of discovering in Cornwall last uly. This success led to our determination of again visiting he Cornish coast in the endeavour of finding the larva in its last stage, and our hopes of making its acquaintance were realized on the afternoon of June 3rd last. As may be imagined, it was with no small amount of satisfaction that we then, for the first time, had before us a natural object which had never been seen by anyone before, and had been wrapped in mystery and remained one of the greatest of entomological puzzles.

By the observations I previously carried out in connection with the relations existing between this larva and ants (recorded in vol. xxxvi. pp. 58–9), and not being able to discover any proof showing that they passed their last stage in ants' nests, also from the site chosen by the larva for pupation, it appeared likely that the larva fed on either the blossom or the tender shoots of the younger furze bushes; and this idea was strengthened not only by the position of the pupa, but also by the usual habit of the butterfly in selecting the flower-heads of thyme growing up through the young furze, especially those freshly grown after being burnt down, which are shorter, dense, and of tender growth, to deposit their eggs upon. Therefore, upon arrival at the locality where we previously (last July) watched the females depositing, we set steadily and systematically at work in closely examining every particle of growth and surface of the ground. This occupied the whole of the first day and half of the next; the intervening night was spent in making a careful search by lamp-light. As this all proved fruitless, we then determined on searching all the most likely-looking ants' nests; first one, then another, was carefully dug up and searched without any satisfactory result; but, knowing the object of our investigation must be somewhere in the immediate vicinity, we continued our task, when at length, upon shaking part of the crown of the nest over a cloth, a goodly-sized, plump, cream-coloured, grub-like larva fell out, which I instantly identified as a full-grown *arion* larva. On closer examination, I noticed that the disc on the first segment appeared exactly of the same size as in the larva after the third moult and before hybernating, and that its head was so disproportionately small for the size of its body, that I at once concluded it had not passed through another moult, but could not decide upon this for certain until microscopically examining all detail later on. To our surprise, in the same small portion of ants' nest, we found three more *arion* larvæ. Three were almost similar in size, about $\frac{9}{16}$ in., and one a good deal smaller, measuring only $\frac{3}{8}$ in. long. These four larvæ were only just beneath the surface among the roots of the little plants of grass growing with the thyme; the soil surrounding them was loose and friable, worked up by the ants. There were, in company with the *arion*, ants and their larvæ and pupæ.

Upon the success of finding four larvæ together in the space of about three inches square, we felt almost sure of finding more; but although we devoted another hour or two that evening and part of the next day in examining a great number of ants' nests, we were unable to find any more, which appears remarkable, especially after finding four in one nest. Considering the large quantity of nests examined, I doubt if future searching will prove a very successful undertaking.

Description of larva: The fully-grown larva, after third and

last moult, measures $\frac{7}{12}$ in. long. This remarkable caterpillar passes over ten months of its existence in its last stage, and that is after its third moult, as upon a careful microscopical examination of all structural detail, I find every part absolutely unchanged, which accounts for its extremely small head, which is out of all proportion to the size of the larva, and only proportionate soon after the third moult, when it measures only $\frac{1}{8}$ in. long. The small black dorsal disc on the first segment now appears as a mere speck. The head is set on a very flexible retractile neck which can be readily protruded beyond the first segment while the larva is in motion; but when resting, the head is completely hidden and withdrawn into the ventral surface of the segment. Dorsal view: Both anterior and posterior segments are rounded, the body gradually increasing in width to the tenth segment. The segmental divisions are deeply cut, each segment being laterally convexed. Side view: First anterior and last three posterior segments somewhat flattened dorsally and projecting laterally; second to ninth segments humped dorsally; the medio-dorsal furrow usual to *Lycæna* larvæ is, in *arion*, only indicated on the posterior half of each segment; the sides are sloping and convoluted to the spiracles; the lateral ridge is dilated, swollen, and prominent, but rounded, and the ventral surface is full and of a bulbous character; the rather small feet are well provided with strongly-curved hooks. All other structural details are as in the description given of the larva after third moult in vol. xxxii. p. 105. But on examining the full-grown specimen, I find that all the long dorsal hairs have been broken or worn off short, leaving only a series of basal stumps.

The colour is a pale creamy ochreous, with a pinkish lilac tinge along the lateral ridge and surrounding both the first and last segments. When first found, the entire skin had a shining distended appearance, as if too tight for its obese proportions. Although I have not yet been able to ascertain its actual food or manner of feeding, I think there is but little doubt that it is tendered by the ants (*Lasius flavus*), in the same way as their own larvæ are fed from mouth to mouth with food the ants disgorge. This point of its life-history I hope to clear up later on.

The larva described pupated on the surface of the ground, free of web, on the evening of June 10th. At first the pupa is a clear pale apricot-yellow, which very gradually deepens to a dark amber colour, excepting the wings, which remain light ochreous.

June, 1906.

DESCRIPTION OF A NEW SPECIES OF AUSTRALIAN CICADIDÆ.

By W. L. Distant.

The British Museum has just acquired from Queensland a Cicada of very exceptional interest. It belongs to the genus *Cyclochila*, founded by Amyot and Serville in 1843, of which only one species (*C. australasiæ*), figured by Donovan in 1805, was hitherto known in entomological records.

Cyclochila virens, sp. n.

♂. Body above olivaceous green, the abdomen darker than head and thorax; body beneath paler and brighter green, the abdomen shining brownish green; transverse striations to front and face, anterior lateral margins of vertex, eyes, lateral margins of pronotum, narrow posterior margins to dorsal abdominal segments, lateral margins of clypeus, inner areas of coxæ and trochanters and the rostrum, pale or dark tawny brown; tarsi, anterior tibiæ and apex of rostrum fuscous brown; ocelli bright shining yellow placed in a small triangular black fascia; basal margins of eyes more or less sanguineous; opercula distinctly overlapping at inner basal areas; tegmina and wings hyaline, the venation green; tegmina with the costal membrane, post-costal area, and basal cell green, wings with nearly half of anal area green.

Allied to *C. australasiæ*, Don., but differing by the overlapping basal areas of the opercula, and the straighter and less sinuate lateral margins to same, less ampliate and nonangulate lateral margins of the pronotum, shorter and less produced head, shorter and broader abdomen which beneath is obliquely inclined upward, face less prominently transversely striate, &c. Long. excl. tegm. ♂ 43 millim. Exp. tegm. 122 millim.

Hab. Queensland (F. P. Dodd, Brit. Mus.).

NEW AMERICAN BEES.—I.

By T. D. A. Cockerell.

(Concluded from p. 127.)

Perdita bishoppi, n. sp.

♀. Length 4 mm. or slightly over; male 3½ or rather more; in my table (Proc. Phila. Acad.) the female runs to *P. californica*, male; the male runs to the same, or, by reason of its paler nervures, would run as well to *P. vespertilio*, male.* It is also near *P. vagans*. From *vagans* and *vespertilio* it is readily known (male) by the much shorter lateral face-marks; it also differs conspicuously in the face-marks from *californica*.

* *P. vespertilio* was described only from the male. Both sexes were taken at flowers of *Aplopappus* (s. lat.) on the sand-hills at Mesilla, New

♀. Head dark bluish green, thorax a yellower green, quite hairy; mandibles with the apical half ferruginous, and the basal with a pallid patch; mouth-parts long for so small a species; face-marks dull pale yellowish; clypeus light, except the usual dots; *lateral marks quadrate, somewhat broader than long*, not reaching above level of clypeus; no supraclypeal or dog-ear marks; flagellum brown beneath, extreme tip almost orange; wings strongly iridescent; nervures and margin of stigma sepia; marginal cell ordinary, the post-stigmatal part about as long as substigmatal; third discoidal distinct; legs piceous, small joints of tarsi becoming pallid; *abdomen brown-black, without markings*; venter dark brown; apical plate ferruginous.

♂. Smaller, but in general like the female, having the same face-markings; base of mandibles and flagellum beneath pale; anterior tibiæ wholly light in front.

Hab. Paris, Texas, August 26th, 1905; two females, one male, on plant not determined (F. C. Bishopp). Sent by Mr. Crawford. Also allied to *P. ignota*.

Perdita bishoppi, var. (or *ignota* ?).

At Handley, Texas, August 3rd, 1905; Mr. J. C. Crawford collected two males and two females of a *Perdita* at flowers of *Isopappus divaricatus* (Nuttall). One of the females would pass very well for *P. ignota*, Ckll., except that the front is minutely rugulose, and only the second and third abdominal segments have transverse white marks. This specimen also approaches *P. vespertilio*, in that the face-marks are white, and the flagellum is entirely pale beneath. The lateral marks are reduced to roundish white spots not nearly reaching orbital margin. The nervures and stigma are wholly pale. The female *vespertilio* has a fine broadly interrupted whitish line at the extreme base of second segment, representing the first white band of *ignota* and the insect from *Isopappus*. Comparing the *Isopappus* female more minutely with the type of *bishoppi*, it is seen that the thorax is bluish green instead of yellowish green; the labial palpi seem not to be quite the same—for instance, the second joint is not over 120 μ long, but 150 in *bishoppi*; and, more especially, the apical plate of the abdomen is narrowly truncate, the truncation about 45 μ across, and emarginate, whereas in *bishoppi* the truncation is quite 80 μ across, and not at all emarginate. The pollen-grains collected by the *Isopappus* female, and those by type *bishoppi*, look to me exactly the same; globular, spinulose, about 25 μ diameter, appearing white when seen singly.

So far, the *Isopappus* insect seems quite distinct from *bishoppi*; but the other *Isopappus* female, collected at the same time and

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Mexico, June 27th, 1897. The female *vespertilio* differs from *bishoppi* by the white face-marks, the lateral marks somewhat larger and triangular, the flagellum entirely pale beneath, and the pallid tarsi. They are, however, very similar. The lateral marks of female *vespertilio* are shaped as in the male, but considerably smaller.

place, has no white marks on abdomen, the nervures are partly darkened (the marginal cell and border of stigma quite as in *bishoppi*), and the apical plate of the abdomen is entirely as in *bishoppi*. Yet the face-marks are white (the clypeus has two blackish bars), the mandibles have the base wholly dark, and the labrum is dark. The mesothorax is coloured exactly as in *bishoppi*.

The males have small lateral face-marks; not at all the large marks of *P. vespertilio*. They have not the white lines on the abdomen.

It is impossible to reach a perfectly satisfactory interpretation of these *Isopappus* specimens, but they appear to be intergrades (or hybrids ?) between *bishoppi* and *ignota*.

Perdita cambarella, n. sp.

♀. Length about or a little over 4 mm.; male 3½. The female, in my table (Proc. Phila. Acad.), runs to *P. chamæsarachæ*, but differs conspicuously from that by the much less shiny thorax; the abdomen is also a deeper shade of red. The clypeal marking somewhat recalls *P. asteris*. The male shows some resemblance to *P. vagans* and *vespertilio*.

♀. Head and thorax green, for the most part a rather yellowish green, but the face strongly bluish green; thorax above hairy, and dullish; mandibles with a large yellow basal patch; face-markings yellow (reddened by cyanide in type), confined to clypeus and lateral marks; clypeus with the upper lateral corners broadly dark, the yellow sending a large pointed process upwards in the middle line, and a slight projection at each side, reminding one of the rostrum of certain crayfishes (*Cambarus*); lateral face-marks triangular, the upper corner not reaching level of antennæ; antennæ dark above, yellow beneath; prothorax with two yellow marks on upper margin, and marks on tubercles; nervures and broad margin of stigma sepia-brown; marginal cell normal, its post-stigmatal part about as long as substigmatal; third discoidal distinct; anterior knees, and tibiæ in front, yellow; abdomen broad, bright deep apricot colour, without markings, except a fine longitudinal black line on each extreme side of second segment; venter the same colour.

♂. Smaller; head and thorax bluer; clypeus all light; tarsi very pale yellowish; nervures colourless, but margin of stigma pale brown; abdomen suffused with dusky, so that it is brown rather than red, or red with a broad dusky band on second segment only.

Maxillary palpi 6-jointed; labial palpi 4-jointed not especially elongated; first joint about 450 μ, second 120, third, 75, fourth 65; claws of female simple, of male cleft.

Hab. Paris, Texas, August 26th, 1905; at flowers of plant not determined (the pollen collected is very light yellow, the grains spherical); two of each sex (F. C. Bishopp). The name *P. cambarella* has reference to the resemblance of the clypeal marking of the female to the end of the rostrum of *Cambarus*. The specimens were sent by Mr. J. C. Crawford.

University of Colorado: March 15th, 1906.

ON SOME NEOTROPICAL VESPIDÆ.

By P. Cameron.

Eumenes henricus, sp. nov.

Black, the head and thorax densely covered with pale pubescence, which, on the vertex and mesonotum, has a fulvous tint; a mark between the antennæ, its upper part distinctly narrower than the lower, a line on the sides of the upper half of the clypeus, a short narrow line on the top of outer orbits, yellow; the apices of the basal two abdominal segments narrowly, of the others broadly rufous (probably discoloured); the inner apical half of the mandibles and the fore tibiæ in front obscure rufous (perhaps a discoloured yellow). Wings fuscous violaceous. Female. Length to end of second abdominal segment, 13 mm.

Panama. Belongs to the Division Alpha, *b* (Syn. Am. Wasps, 92).

Clypeus smooth, impunctate below, the upper part sparsely, weakly punctured; the rest of the head, thorax, and second segment of abdomen closely and strongly punctured. Clypeus widened below, its apex with a shallow rounded incision in the middle. Thorax short, broad, the sides rounded in front; the sides of the metanotum broadly rounded; the depression is on the apical half only; it is narrow at the base, becoming gradually widened towards the apex. Abdominal petiole long, distinctly longer than the head and thorax united, but not quite so long as the rest of the abdomen; its basal third slightly narrowed, sparsely punctured and shining at the apex, the rest more strongly and closely punctured; close to the apex, in the middle, is a shallow transverse not very distinct furrow, which becomes transversely widened and deepened at the apex; the apex has a raised border; the second segment is elongated pyriform, almost twice longer than the width at the apex; the base is clearly narrowed, becoming gradually wider towards the apex, which is smooth and slightly raised; the petiole is not much depressed above; the apex, looked at especially from the sides, is seen to be transversely furrowed.

The thorax is clearly longer than wide; it has no longitudinal furrows. The species looks like a small form of *E. centralis*, Cam.; apart from the latter having the clypeus, base of legs, and pleuræ marked with rufous, it may be known by the much less strongly punctured head and thorax, by the metanotum being furrowed throughout, and by the abdomen being perfectly smooth.

Polybia tapajosensis, sp. nov.

Black, tinged with brown; the legs and abdomen rufous brown; the apex of the first abdominal segment narrowly yellow; wings fuscous violaceous, the nervures and stigma black. Prothorax without lateral angles. Female. Length to end of second abdominal segment, 13 mm.

Rio Tapajos, Amazons (Prof. J. W. H. Trail).

Head and thorax densely covered with silvery pubescence. Clypeus smooth and shining, longer than wide; in the centre of the apex is a broad flat keel, which becomes gradually widened below, and depressed at the extreme point; on either side of this is a narrower keel; the sides of the apex are depressed, almost foveate. Mandibular teeth rufous. The raised lower part of the front is rounded below; it becomes gradually raised, then becomes gradually obliquely depressed; the upper part is hollowed below in the centre. Base of thorax rounded. Scutellum large, wide; the post-scutellum with a slight rounded slope, its apex broad, transverse. Abdominal petiole slightly longer than the post-scutellum and metanotum united; it becomes widened from the middle, the basal part being distinctly narrowed; it is slightly longer than the second segment, which is bell-shaped, roundly narrowed at the base, without a distinctly narrowed part there. Ocelli ·.· . Mesopleural furrow single, curved below.

Comes near to *P. rejecta*, with some of the forms of which it agrees in coloration; *rejecta* may be known from it by the angled prothorax, by the post-scutellum being dilated behind in the middle, not transverse, by the metanotum not being furrowed, and the wings are more hyaline.

Polybia melanocephala, sp. nov.

Head and antennæ black, the second and following segments of the abdomen fuscous black, the thorax and abdominal petiole dark rufous, the pleuræ darker coloured than the mesonotum, the base of the thickened part of the petiole with a large black mark; legs coloured like the thorax, the coxæ darker coloured; wings dark fuscous violaceous; the nervures and stigma black. Female. Total length, 12–13 mm.

Rio Purus, Amazons (Prof. J. W. H. Trail). Agrees best with Saussure's Division M. Y. (4).

Abdominal petiole nearly as long as the metanotum and scutellums united. Body covered densely with a short pale pubescence, which appears golden on the mesonotum. There is a distinct malar space, which is fully as long as the antennal pedicle. Ocelli ·.·; the hinder separated from the eyes by four times the distance they are from each other. Clypeus nearly as long as the greatest width. The space between the antennæ is raised, somewhat triangular, the narrowed end below; the upper part with a short wide distinct furrow. Temples roundly narrowed. There is a short furrow or impressed line on the base of the mesonotum, and a wider one below the tegulæ. Scutellum large, wide, not furrowed. Second abscissa of radius one-fourth of the length of the third, and slightly more than the length of the space bounded by the recurrent nervures. Angles of pronotum rounded. There is no sculpture, the entire body being smooth.

A distinct species. In coloration and size it is very similar to *Apoica cubitalis*, Saus., as figured by Saussure, 'Vespides,' i. pl. xviii. f. 3.

Polybia sericeibalteata, sp. nov.

Dark ferruginous, the greater part of the post-petiole and the base of the abdominal segments broadly blackish fuscous; the base of petiole

pale testaceous; the flagellum of antennæ black; densely covered with a pale pile, which is white on the pleuræ, pale fulvous tinted on the mesonotum, and on the abdomen it forms broad apical bands, which have a decided fulvous tinge; the apex of the second and the following abdominal segments are black. Wings hyaline, tinged with violaceous; the costal cellule dark fulvous; the stigma dark rufous. Female. Length (total), 15 mm.

Rio Purus (Prof. J. W. H. Trail).

Body opaque, without punctuation; the sides of the vertex closely, obscurely, obliquely striated. Pronotum rounded, not angled. Centre of mesonotum closely, irregularly, distinctly, transversely striated, the striæ more or less twisted; on either side is a broad fuscous longitudinal line, with a shorter less distinct one at the base; a little behind the middle is a deep clearly defined longitudinal furrow. Post-scutellum hardly raised above the level of the scutellum; its apex is bluntly rounded, almost transverse; the apical slope is short, rounded, it only commencing at the apex, not sloping gradually from the base to the apex, as in *flavicans*. Metanotum widely, deeply furrowed in the middle, the furrow with obliquely sloped sides, *i. e.* it is deepest in the middle. Mesopleural furrow deep, clearly defined, oblique, curved below, not reaching to the middle. Ocelli ·.·, widely separated from the eyes. Front at the antennæ raised; this raised part is obliquely depressed at the base and apex, the basal slope being longer than the lower, and bears a deep furrow in its middle. Clypeus smooth, longer than wide, its apex in the middle broadly rounded, ending in the centre in a blunt black point. Petiole as long as the post-scutellum and metanotum united; the base is distinctly narrowed, the apex pyriform, clearly separated, abruptly dilated, more so than in *dimidiata* or *rejecta*; the second segment bell-shaped, broadly narrowed at the base, appearing therefore wide compared with the apex of the petiole; it is longer than it is wide at the apex.

The colour is darker than in any species of *Polybia* I have seen, the rufous colour being more tinged with fuscous, somewhat as in dark examples of *Polistes rubiginosus*; it is more densely pilose than usual, and the post-scutellum is more rounded, not sloped at the apex; the metanotal furrow is deeper and more clearly defined, and the apex of the clypeus more broadly rounded, not so distinctly brought to a point in the middle as in the typical species, more, *e. g.*, as in *P. filiformis* than in *P. rejecta*. It is related to *P. micans*, Ducke.

Among other species of *Polybia* taken by Prof. Trail are *P. flavicans*, F., Rio Jurua; *P. dimidiata*, Ol.; *P. liliacea*, F.; *P. traili*, Cam., and *P. occidentalis*, Ol., type; and var. *pygmæa*, F., Rio Purus. Three species of *Synœca* were taken on the Rio Purus: *azurea*, Sauss., *surinama*, L., and *testacea*, Sauss. *Apoica arborea*, Sauss., was taken on the Rio Purus.

A GUIDE TO THE STUDY OF BRITISH WATERBUGS (AQUATIC HEMIPTERA OR RHYNCHOTA).

By G. W. Kirkaldy.

(Continued from p. 83.)

Plea, Leach.*

Resembles an animated grain of sand. There is a single British species:—

1. P. leachi, McGregor & Kirkaldy (= *minutissima*, Fabr., nec Linné). Generally distributed. It is probably *N. atomaria*, Pallas. It has a funny paddling gait in the water, more like certain beetles than any of its allies. It probably oviposits in a similar manner to *Notonecta*.

This closes the account of the true waterbugs belonging to the Pagiopodous division. We now have to consider an aquatic family of the Trochalopoda, *viz.*, the Nepidæ, containing two British forms, *Nepa cinerea* and *Ranatra linearis*.

Fam. Nepidæ.

The Nepidæ are apparently descended from a protoreduvioid stock, and have, like the aquatic Pagiopoda, become modified for existence in their newer habitat. Their most conspicuous differential character is the filamentary caudal tube, which is used for respiratory purposes, and is simply two elongate, modified spiracles, and which varies in length according to the species. Fieber, in his anxiety to ally the Nepidæ to the Belostomatidæ (a family of giant, extra-British waterbugs), termed these filaments "aidothecal appendices," although they have been known certainly to be respiratory, not sexual, for one hundred and seventy-eight years; while taking in a fresh supply of air the end of the tube is simply thrust out of the water. In the nymphs the tube is shorter and stouter.

The head is porrect; the rostrum short, stout, and curved, composed of three (apparent) segments; the body flat in *Nepa*, subcylindric in *Ranatra*; the antennæ are composed apparently of three short segments, the second of which is produced laterally. In the water the legs are moved *alternately*, in contrast to the aquatic Pagiopoda, in which they are moved synchronously; the anterior pair are strongly raptorial, the other pair slender, not ciliate; the tarsi are not segmentate, and terminate in two claws. Their gait is leisurely, a sort of paddling rather than swimming. They remain motionless for hours concealed, or partly concealed, in the mud of the ponds or canals in which they live, or clinging to the stems of water-plants, lying in wait for such prey as they can overpower, not sparing their own kin,

* From Greek *pleo*, I swim.

though seemingly content with *Daphnia* or *Cyclops*, among the Entomostraca. Although in a "hand-to-hand" fight they would stand no chance with the fierce *Notonecta*, yet such is the grip of their raptorial front legs, that an unlucky water-boatman venturing heedlessly within range of the stroke of the silent scorpion will be seized and sucked without being able to struggle successfully, or use his powerful beak to advantage. The Nepidæ also suck fishes' eggs, and even attack small fish and tadpoles.

Owing to their remarkable shapes, the Nepidæ were favourite objects of study with the older naturalists, and their structures and life-histories have often been sketched superficially, though precise descriptions and figures are still desiderata. Their anatomy and embryology have been dealt with by such workers as Dufour, Heymons, Korschelt and Heider, Locy, Lacaze-Duthiers, J. Martin, Marshall and Severin, Schmidt and Will. Bachmetjer (1900, Illustr. Zeit. Ent. v. 88) quotes Pouchet that *Ranatra*, *Nepa*, and *Notonecta* can sustain life for three hours at a temperature of $-16°$ C.

Like the other waterbugs, the Nepidæ are subject to the attentions of larval Hydrachnidæ.

There are two genera of Nepidæ in Britain, easily recognized by their shape; each has a single British species.

1. Flat, broad	*Nepa cinerea*, Linné.
2. Elongate, subcylindric . .	*Ranatra linearis* (Fabricius).

Nepa cinerea, Linné.*

This is the *Nepa scorpio-aquaticus* of De Geer. The prevailing colouring is dirty brown, but when the tegmina and wings are spread the greater part of the tergites is seen to be bright red.

Handlirsch declares that Swinton's diagrams of the stridular organs in this genus are false, and that *Nepa* does not stridulate. As *Ranatra*, however, has recently been discovered by my friend Bueno to stridulate, it is probable that *Nepa* does also, though both Swinton and Handlirsch have overlooked the proper apparatus.

The earliest representation of *Nepa* known to me is in Moufet's 'Insectorum sive minimorum Animalium Theatrum,' p. 321 (1634), where three recognizable figures of "*Scorpio palustris*" are shown; the third, while representing a nymph, indicates tegmina, the details having probably been filled in from an imago. Frisch, in 1728, in his work above mentioned (vii.

* Latin *nepa*, a scorpion; it was also used by Cicero to denote the constellation of the same name, but Plautus employed it to denote the constellation "Cancer." Geoffroy, following Schaeffer, arbitrarily altered it to *Hepa*.

pp. 22–4, pl. xv. figs. 1–6) gives some reasonably good figures with the name of the "broad waterbug with the two trap-claws and the posterior air-tubes." The present name of "water-scorpion" is that now used, or its equivalent, in almost all European countries.

Nepa cinerea occurs more or less commonly all over lowland Britain.

The metamorphoses were partially figured by De Geer in 1773, while figures of nymphs will be found in most "aquarium" books; the ova are figured by Dufour, Sharp, &c. The latter are oval, terminated by seven filaments, and are inserted in the stems of water-plants.

Ranatra linearis.*

The stridulation of an American species has been described lately by J. R. de la Torre Bueno (1905, 'Canadian Entomologist,' xxxvii. 85–7, figs. 5–11). "Two opposing rasps, one on coxa near base with longitudinal striations, the other on inner surface of cephalic margin of lateral plate of coxal cavity, which plate, by its thinness, must act somewhat in the nature of a sounding-board." Both adults and nymphs stridulate, and under water as well as out of it.

The earliest representation of *Ranatra* is also in Moufet (p. 321)—in a characteristic attitude—where it is termed "*Locusta*"; in 1693 Swammerdam ('Historia Insectorum,' p. 85) calls it "*Scorpius* (!) *aquaticus*." Apparently, however, Aldrovandus, in 1602 ('De Animalibus Insectis,' a huge work I do not possess), refers to it under the name of "*Tipula aquatica*"; the true *Tipula* (or rather *Tippula*) of the ancients was, however, probably a Gerrid (almost certainly not a dipteron as Linnæus thought). Frisch in 1728 (vi. pp. 24–5, pl. xvi. figs. 1–6) terms it the "big narrow waterbug with the trap-claws and posterior air-tubes"; according to him the Italians called it "Cavalluccio."†

The metamorphoses of *Ranatra* were well figured by Geoffroy

* The etymology of *Ranatra* is uncertain, possibly a portmanteau word from *rana* and *atra*, "a frog" and "black." A fish (*Lophius piscatorius*) was called "*Rana marina*" by Cicero.

† The earliest representation of *Notonecta* is also in Moufet. On p. 320 he says:—"*Notonecta* we call a certain aquatic insect which swims not on its belly like the others, but lying on its back, from which men have probably learnt to hyptionecticate—that is, their skill of swimming supinely"! Moufet apparently recognized the remarkable colour variation of *N. glauca*, for he says:—"Of these, in some the eyes, scapulæ, and body are blackish; in others greenish, in others bronzy, in others pitchy; for rarely seem two of the same colouring, so varied is the nature of their pattern." Four figures are shown, three representing more or less typical *glauca*, with vars. *maculata* and *marginata*, the fourth a nymph. In Switzerland the "boatfly," according to Frisch, is called "glyssling," from its shining appearance when covered with air-bubbles (from "gleissen").

in 1762. Later, Enock has detailed the method of oviposition (1900, Ent. Mo. Mag. p. 161, &c.).

According to Roesel von Rosenhof, the eggs are simply dropped to the bottom of the water, and hatch in about a fortnight; as, however, in *Notonecta*, this is probably due to the fact that a female held in captivity could not find a suitable place for deposition. In nature they are inserted in the stems of *Scirpus*, or in the leaves of *Potamogeton*, only the filaments being apparent. The ova are more elongate than those of *Nepa*, and are terminated by but two filaments. They are figured by Geoffroy and Dufour. According to Enock they are, like those of other aquatic bugs, parasitized by the curious hymenopteron, *Prestwichia aquatica*. According to Douglas, *Ranatra* winters as a nymph.

Ranatra linearis is rarer than *Nepa*, and apparently does not occur north of the middle of England.

(To be continued.)

THE LEPIDOPTERA OF THE DORKING DISTRICT.

By F. A. Oldaker, M.A.

Having now left Dorking, after a residence there of seven years, I think it may be of interest if I give a complete record of my captures. Many of these have already appeared from time to time in the 'Entomologist,' and my only apology for repeating them is the additional value that may attach to a consecutive account of my work. That work has, I fear, been far from complete, for, owing to my business engagements, I was unable to give the time and attention I should like to have devoted to entomology, but I hope that such as it is the record may be of interest and of some value. The dates attached to the various species in their different stages are in every case the first recorded in my diary.

Pieris brassicæ, *P. rapæ*, *P. napi*. Always abundant, and the larvæ usually swarmed on nasturtiums in my garden.

Euchloë cardamines. Common on Ranmore and in Polesden. Ova found on *Alliaria officinalis*. Larvæ pupated, July 6th. Very little variation observed in the imagines, except as regards size.

Colias edusa. Male taken in Dorking, September 13th, 1900.—*C. hyale*. Two males taken in Holmwood, August 7th, 1901.

Gonepteryx rhamni. Hybernated specimens common everywhere. Ova and larvæ taken on Ranmore. Imago, July 25th.

Argynnis euphrosyne. Common on Ranmore, 1903 (May 27th), and in Polesden, 1901. Other years only seen singly.—*A. adippe*. *A. aglaia*. Abundant on Ranmore in July, 1901, but none seen either before or since.

Vanessa polychloros. Hybernated specimens very common in Dorking, Wotton, and Holmbury St. Mary, in 1900 and 1901 (April 1st). Larvæ emerged May 13th, pupated June 11th; imagines June 29th. A few seen in March, 1902, but none since.—*V. urticæ.* Exceedingly common everywhere. The larvæ to be found in great numbers every year.—*V. io.* Uncertain in appearance. Most abundant in 1901. Pupated, July 1st; imagines, July 12th.—*V. atalanta.* Never plentiful, but several seen nearly every year; imagines, August 26th. —*V. antiopa.* One specimen seen by a gamekeeper on Ranmore in September, 1903.—*V. cardui.* One specimen taken in Dorking, June 11th, 1902. (N.B. This species was very abundant at Bembridge, Isle of Wight, during August and September, 1902.)

Melanargia galatea. One specimen taken at Dorking, July 26th, 1900.

Pararge egeria. Always abundant at Polesden, and fairly plentiful on Ranmore. May 15th.—*P. megæra.* Taken on Ranmore, June 4th, but never common.

Satyrus semele. Common on the chalk slopes on the south side of Ranmore. July 12th.

Epinephele jurtina. Swarming everywhere. Larvæ taken on Ranmore pupated June 22nd; imagines, July 9th. Two bleached specimens taken, September 4th, 1901, and July 27th, 1904.—*E. tithonus.* Common on Ranmore. July 26th.

Aphantopus hyperanthus. Common on Ranmore. July 8th.

Cœnonympha pamphilus. Exceedingly common everywhere.

Thecla w-album. Larvæ taken on Boxhill; pupated, June 10th; imagines, June 28th. Fairly abundant, especially in 1902.

Zephyrus quercus. Larvæ beaten on Ranmore; pupated June 4th; imagines, June 28th. Always abundant.

Callophrys rubi. Very plentiful in 1902, May 12th. Fairly plentiful in other years. Dorking, Ranmore, and Polesden.

Chrysophanus phlæas. Always abundant everywhere.

Lycæna astrarche. Taken sparingly on Ranmore and at Polesden. June 6th.—*L. icarus.* Very abundant everywhere. April 21st. Two interesting aberrations taken in 1902—(1.) Underside with faint marginal spots, and only one inner spot, June 7th. (2.) Gynandromorphous specimen, male on the left side, female on the right, June 14th. (*Vide* Entom. xxxv. 218).—*L. bellargus.* Always plentiful on a certain patch on the south side of Ranmore. May 28th, August 15th. —*L. corydon.* Very plentiful in 1901, on the south side of Ranmore; in other years only a few specimens seen. July 20th.—*L. minima.* Common in a chalk-pit in Dorking, and on the south side of Ranmore. June 10th.

Cyaniris argiolus. Common in 1901. April 30th. Holmwood and Dorking, one or two specimens seen in 1900, 1902, and 1904; but none at all seen in other years.

Nemeobius lucina. Always abundant at Polesden, and getting more plentiful and more widely distributed on Ranmore every year. Ova to be found on the under side of cowslip-leaves, sometimes as many as ten on a leaf, but oftener only one or two on a plant; ova deposited, May 23rd; larvæ emerged, June 4th; pupated, July 8th; imagines, May 15th.

Hesperia malvæ. Generally common on Ranmore. May 15th.

Thanaos tages. Very abundant at Polesden, and on Ranmore. May 15th.

Adopæa thaumas. Very abundant at Polesden, on Ranmore, and in the district generally. July 7th.

Augiades sylvanus. Very abundant at Polesden and on Ranmore. June 10th.—*A. comma.* Common on one particular patch on Ranmore, but none seen elsewhere. July 16th.

Acherontia atropos. One specimen flew indoors in October, 1900.

Sphinx ligustri. Common in Dorking. Larvæ emerged, June 10th; pupated, July 17th; imagines, June 4th.

Deilephila galii. One taken at rest in 1899.—*D. elpenor.* Fairly common in Dorking. Larvæ, July 11th; pupated, August 11th; imagines, June 1st.

Smerinthus ocellatus. Common at the lamps in Dorking. Larvæ, June 5th; pupated, July 12th; imagines, May 16th and August 9th (second brood).—*S. populi.* Very common at the lamps in Dorking. Larvæ, June 4th and August 5th (second brood); pupated July 2nd and September 11th (second brood); imagines, May 12th and July 24th (second brood).

Dilina tiliæ. Common. Larvæ, June 4th; pupated July 7th; imagines, April 26th.

Macroglossa stellatarum. Seen sparingly at intervals, especially in 1901.

Hemaris fuciformis. (Broad-bordered). One specimen taken at Polesden, June 10th, 1901.

Sesia myopiformis. Larvæ found in an apple-tree in my garden; imagines, July 2nd. It seems a remarkable fact, that every year since first observed in 1902, the imagines have first appeared on July 2nd.

Zygæna filipendulæ. In 1900 and 1905 the pupæ were in countless numbers on the south side of Ranmore; imagines, July 17th. In other years some have been seen, but the species was not at all common.

Hylophila bicolorana. Taken at lamps in Dorking, July 22nd.

Nola cucullatella. Larvæ very common on Ranmore in May and early June; spun up, May 31st; imagines, June 26th.

Endrosa irrorella. Taken on the south side of Ranmore, but never abundant. June 27th.—*E. sororcula.* Taken on the same ground as *irrorella.* June 11th.—*E. deplana.* Beaten from yews on Ranmore. July 19th.—*E. lurideola.* Taken on the same ground as *irrorella.* July 10th.

Gnophria rubricollis. Taken at rest on tree-trunks in the Redlands, Dorking, June 7th.

Hipocrita jacobææ. Very abundant at Polesden. Larvæ swarming on ragwort, and one observed feeding on greater knapweed; pupated, July 22nd; imagines, May 13th.

Arctia caja. Very common at the lamps in Dorking, and larvæ frequently found; spun up. June 20th; imagines, July 11th.—*A. villica.* Very abundant in 1905; other years in fair numbers. Ova deposited, June 10th; larvæ, June 23rd; spun up, May 2nd; imagines, June 9th.

Spilosoma lubricipeda. Very common at the lamps in Dorking. Larvæ, June 27th; imagines, May 22nd. — *S. menthastri.* Very common at lamps. May 10th.

Hepialus humuli. Taken at the lamps and by dusking. June 10th. —*H. lupulinus.* Taken at the lamps. June 7th.

Zeuzera pyrina. Taken at rest, July 6th; ova deposited, same day. Larvæ, July 23rd, died.

(To be continued.)

NOTES AND OBSERVATIONS.

Collecting in France. — I shall be greatly obliged if collectors visiting French localities other than the Alps will kindly send me a note of the butterflies captured or observed by them, with dates.—H. Rowland-Brown; Oxhey Grove, Harrow Weald.

Orthetrum cærulescens in Essex.—On July 22nd, 1900, we took, in Epping Forest, near Chingford, a male specimen of this dragonfly, but we have never obtained another example. We were unable to find any other record of the occurrence of the species in Essex, and it is not even included in Doubleday's generous list of 1871.—F. W. & H. Campion; 33, Maude Terrace, Walthamstow.

Panorpa germanica.—On June 13th last, I took, near Haslemere, an almost immaculate male of this species. The chief markings are a black tip to each of the wings, and a black spot at the pterostigma. This form of the insect looks very different from the usual one, which is very much more spotted.—W. J. Lucas.

Food of Monopis rusticella.—In the 'Proceedings' of the Zoological Society for 1896, p. 281, Lord Walsingham observed: "It would be curious to ascertain whether our common *T. tapetzella* has ever been found feeding in the dry casts of owls." . . . . I do not know whether this has yet been recorded, but this year I found some owl's casts containing larvæ, and bred from them a number of specimens of *Monopis rusticella.* — (Major) C. G. Nurse; Timworth Hall, Bury St. Edmunds.

Tephrosia luridata, aberration.—On May 6th, 1906, I had a nice variety of *T. luridata* (*extersaria*) emerge; it is almost white, the ground colour is a shining white, and the usual markings are a pale buff, only just showing out on the white ground. In general appearance it looks very much like a light-coloured example of *Cabera exanthemata*, but more delicate. It was bred from a number of pupæ I had from Mr. Newman, of Bexley. All the other specimens are normal.—William Daws; Mansfield, Notts.

Note on the Resting Attitudes of some Butterflies.—I have noticed recently, both near Aldbury (Herts) and in the Wye Valley (Mon.), cases of heliotropism with *Syrichthus malvæ* and *Nisoniades tages* (particularly the latter). When settling on a flower-head they

almost invariably shift their position until the head is pointing away from the sun. I have also noticed that *N. tages* frequently deflects the wings downwards, so that the tips of the primaries are below the body. The costa, too, is curved downwards towards the tip, and this adds to the effect. Concerning *Cœnonympha pamphilus*, I made observations on a number of specimens near Aldbury on June 17th, 1906. This species usually rests with the wings closed, and almost always sits sideways to, and leans away from, the sun, thus allowing the rays to strike the wings at right angles. I also noticed *Gonepteryx rhamni* behave in the same way at Chepstow, but in the case of this species only one specimen was observed.—PHILIP J. BARRAUD; Bushey Heath, Herts.

THE VAN DE POLL COLLECTIONS.—We understand that the Van de Poll collections of Lepidoptera have been purchased and are being brought to England by Mr. Percy I. Lathy. The collection of Rhopalocera is considered to be the finest ever formed of the Dutch East Indian fauna. The series of each species is long, and has been specially selected from many hundred specimens to show any variation. The collection contains a great number of rarities and undescribed species. Among some of the most noteworthy of the former are the hitherto unknown females of *Ornithoptera sumatrana*, *Papilio insularis*, *P. hewitsoni*, and *P. egialea*, and a remarkable hermaphrodite of *Ornithoptera trojana*.

CAPTURES AND FIELD REPORTS.

DICYCLA OO *var.* RENAGO IN BERKSHIRE. — With reference to the remarks by Messrs. G. L. Cox and J. Brooke (*ante*, p. 128), I thought it would be well to notify that *D. oo* var. *renago* occurs in our district.—W. E. BUTLER; Hayling House, Oxford Road, Reading, June 19th.

VANESSA ANTIOPA IN HAMPSHIRE.—In the 'Field,' June 9th, Mr. N. L. Cripps reports capturing a worn hybernated specimen of *V. antiopa* near Lyndhurst on May 19th last.—F. W. FROHAWK.

DEILEPHILA (PHRYXUS) LIVORNICA IN 1906:—

Cornwall.—I have to record the capture, by the Rev. W. B. Honey, on May 30th, of a very fine specimen of *D. livornica* at Porthgwarra, Cornwall.—(Rev.) J. E. TARBAT; Foxham, Hants.

Devonshire.—I thought it might interest your readers to know that on June 11th last I had given to me a living specimen of *D. livornica*, taken in a florist's shop in Exeter (Rush's) on that day. It was unfortunately much rubbed, and the red of the under wings was faded. Curiously, in September, 1901, I had sent me a much rubbed specimen of *D. celerio*, taken at Wylye, Wilts; so I now have the two "striped hawks," both taken in England, and both much rubbed. — R. V. SOLLY; 40, Southernhay, Exeter, June 21st, 1906.

Hampshire.—I had a specimen of *D. livornica* brought to me to-day by a farm-labourer, who had found it at rest on grass. I should think

it was in fine condition when caught, but, owing to its having been put into the customary match-box, it is now somewhat rubbed.—CHAS. J. BELLAMY; Ringwood, Hants, June 1st, 1906.

D. livornica has turned up again here this season. I have taken ten since May 30th, and saw at least ten others. I have also taken seven *Heliothis peltigera*, during same period, flying to flower, but at 8.30 of the evening.—W. G. HOOKER; Bournemouth, June 12th, 1906.

Kent.—During the naval manœuvres here last week a fine *D. livornica* was taken at one of the land search-lights, and brought to me alive the next morning. Unfortunately it is rather rubbed through being kept in a tin with cleaning gear. It was taken about 10 p.m. on 13th inst. If the nights had not been so cold probably more insects would have been attracted by the lights, which were running all night. (Lieut.) J. J. JACOBS; 63, Marine Parade, Sheerness-on-Sea, June 17th.

I had a specimen of *D. livornica* brought to me on the 5th inst., which had been found by some workmen just outside of Canterbury. The specimen is in very fair condition, and is now in my collection.—F. A. SMALL; 95, Westgate, Canterbury, June 16th, 1906.

Surrey.—A good specimen of *D. livornica* was taken just outside the College by one of our boys on June 10th.—H. V. PLUM; Epsom College.

Sussex.—On June 8th I took a fine specimen of the "striped hawk" (*D. livornica*) in a ride in a wood near this house. It was taken on the wing just at dusk, when a lantern was hardly necessary. It would appear to be an unusually early appearance for this insect, especially as we are five hundred feet above sea-level, and the season is unusually backward. Other good captures so far this season include *P. leucographa*, *N. trepida*, and *N. chaonia*.—JOHN COMBER; High Steep, Jarvis Brook, Sussex, June 14th, 1906.

A good specimen of *D. livornica* was captured inside a window yesterday afternoon (June 6th). Recent winds have been from east and north.—(Rev.) L. H. WHITE; Christ's Hospital, West Horsham, June 7th, 1906.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, May 2nd*, 1906.—Mr. F. Merrifield, President, in the chair.—Commander J. J. Walker showed fourteen examples of both sexes of *Hystrichopsylla talpæ*, Curtis, the largest of the British fleas, taken in the nest of a field-mouse in a tuft of grass at Grange, near Gosport, Hants, on March 28th last.—Mr. G. C. Champion exhibited living specimens of *Apate capucina*, *Deilus fugax*, a *Cryptocephalus* (*rugicollis*), two species of *Anthaxia*, &c., forwarded by Dr. T. A. Chapman from Ste. Maxime, South France.—Mr. F. B. Jennings brought for exhibition an example of the weevil *Procas armillatus*, F., taken near Dartford, Kent, on April 13th last. This species appears to be extremely scarce in Britain, and, with the exception of a single specimen taken near Chatham by Commander Walker in 1896, and exhibited by him at the meeting of the Society held March 18th, 1896, has not been recorded from this country for a

considerable period.—Mr. M. Jacoby exhibited a box of beetles from New Guinea, including *Æsernia meeki*, Jac., *A. costata*, Jac., *A. gestroi*, Jac., and Cetoniadæ and Lucanidæ from South Africa and Borneo.—Mr. H. St. J. Donisthorpe exhibited specimens of *Hydrochus nitidicollis*, Muls., a beetle not hitherto recorded in Britain, taken in the river Meavy at Yelverton, Devon, in April.—The Rev. F. D. Morice exhibited lantern-slide photographs (from nature) of the female *calcaria postica* in Hymenoptera belonging to divers groups, mostly Aculeates, but including also representatives of the Chrysids, Ichneumonids, and Sawflies. He submitted that, in all the examples shown, the structure of the calcaria themselves (and also of the parts adjacent to them) clearly indicated that their main function was that of an elaborately constructed instrument for toilet purposes. The calcaria in all cases seemed to explain satisfactorily all the structural phenomena presented by them (*e.g.* serrated inner margins, pectiniform rows of spines and bristles, brush-like pilose fascicules, &c.). He should be glad to hear of any observations that might have been made as to the structure and functions of calcaria in insects of other orders, having examined them himself only in the Hymenoptera.—Dr. F. A. Dixey exhibited male and female specimens of the African Pierines *Belenois thysa*, Hopff, and *Mylothris agathina*, Cram. He drew special attention to the fact that the resemblance between these two species, which Mr. Trimen speaks of as "deceptively close in both sexes," applies mainly to the dry-season phase of the *Belenois*, and not to the wet. This, he observed, was well illustrated by the exhibit, which included wet- and dry-season examples of both sexes of *B. thysa*; *M. agathina* showing no seasonal change.—Mr. Edward Meyrick, B.A., F.R.S., contributed a paper "On the Genus *Imma*, Walk. (=*Tortricomorpha*, Feld.)."—Mr. H. Eltringham, M.A., F.Z.S., contributed a paper on "The late Professor Packard's Paper on the Markings of Organisms." In the absence of the author, Professor E. B. Poulton, F.R.S., explained the drift of the paper, and expressed his agreement with the main lines of its argument.

Wednesday, June 6th.—Mr. F. Merrifield, President, in the chair.—Mr. H. St. J. Donisthorpe exhibited specimens of *Lomechusa strumosa*, F., taken with *Formica sanguinea* at Woking on May 26th and 29th last. Only two other British examples are known—one taken by Sir Hans Sloane on Hampstead Heath in 1710; the other found by Dr. Leach in the mail-coach between Gloucester and Cheltenham; and these are included in the British Museum Collection.—Mr. H. J. Turner showed a case illustrating a large number of the life-histories of Coleophorids, notes on which have appeared in the Society's 'Proceedings,' or in the 'Entomological Record.'—Mr. A. H. Jones showed on behalf of Mr. Henry Lupton a few butterflies from Majorca, captured between April 8th and April 20th last. Comparing the specimens with those of similar species from Corsica, also exhibited, they appeared to be smaller; the *Pararge megæra* approached the form *tigelius*; the *Cœnonympha pamphilus* differed somewhat in the under side being darker. Only one moth was seen, *M. stellatarum*. But so far under twenty species only of butterflies have been recorded from the Balearic Islands.—Mr. Selwyn Image showed:—(*a*) A specimen of *Crambus ericellus*, Hb., taken at Loughton, Essex, August 8th, 1899—not previously recorded

from further south than Cumberland; (*b*) two specimens of *Nola confusalis*, H.S., ab. *columbina*, Image, taken in Epping Forest, May 5th, 1906 (the first examples of this aberration were taken at the same locality, May 22nd, 1905, and recorded in the Ent. Rec., July, 1905, p. 188); and (*c*) a specimen of *Peronea cristana*, F., the ground colour of upper wings abnormally black, even more intensely black than in the ab. *nigrana*, Clark—taken in Epping Forest, August 19th, 1905.—Mr. J. H. Keys sent for exhibition the type of *Spathorrhamphus corsicus*, Marshall, from Vizzavona, Corsica. This fine Anthribid was supposed by some coleopterists to have been an accidental importation into the mountainous regions of the island, but was no doubt endemic.—Mr. G. C. Champion remarked that he had taken *Platyrrhinus latirostris* in numbers at the same locality, in the beech and pine forests (*Pinus laricio*) along the line of railway, above the tunnel. —Dr. F. A. Dixey exhibited specimens of African Pierinæ found by Mr. C. A. Wiggins on Feb. 2nd, 1906, settled on damp soil near the Ripon Falls, Victoria Nyanza, and caught, to the number of 153, at a single sweep of the net. Eight species were represented; the examples were all males, and, with one exception, belonged to the dry-season form of their respective species.—Professor E. B. Poulton, F.R.S., communicated some notes on Natal butterflies, which he had received from Mr. G. H. Burn, of Weenen, and exhibited the four individuals of *Euralia wahlberghi*, Wallgr., and *E. mima*, Trim., captured by G. A. K. Marshall, near Malvern, Natal. He then explained Mr. Marshall's latest demonstration of seasonal phases in South African species of the genus *Precis*, the proof by actual breeding that *P. tukuoa*, Wallgr., is the dry-season phase of *P. ceryne*, Boisd. — Professor Poulton further showed three hundred and twenty-five butterflies captured in one day by Mr. C. B. Roberts, between the eighth and tenth mile from the Potaro River, British Guiana, and drew attention to the preponderance of males; also specimens of the Halticid beetle *Apteropoda orbiculata*, Mar., with its mimic Hemipteron, *Haltica apterus*, L., from Stone Wood, Oxford; and of the Staphylinid *Myrmedonia canaliculata*, F., with *Formica rufa* race *rugoides* from South Hinksey, the beetle looking extremely like the ant—both taken by Mr. W. Holland. —The following papers were read:—"Some Bionomic Notes on Butterflies from the Victoria Nyanza Region, with exhibits from the Oxford University Museum," by S. A. Neave, B.A.; "On the Habits of a Species of *Ptyelus* in British East Africa," by S. L. Hinde, illustrated by drawings by Mrs. Hinde, communicated by Professor E. B. Poulton; "Mimetic forms of *Papilio dardanus* (*merope*) and *Acræa johnstoni*," and "Predaceous Insects and their Prey," by Professor E. B. Poulton, D.Sc., F.R.S.; and "Studies on the Orthoptera in the Hope Department, Oxford University Museum. I. Blattidæ," "Notes on a feeding experiment on the spider *Nephita maculata*," by R. Shelford, M.A., F.Z.S.—H. Rowland-Brown, M.A., *Hon. Secretary*.

South London Entomological and Natural History Society.—*April 12th*.—Mr. R. Adkin, F.E.S., President, in the chair.—Mr. L. W. Newman, of Bexley, was elected a member.—Mr. Main exhibited a long piece of Gum Animi from West Africa, and called attention to the numerous insects, chiefly Coleoptera, enclosed in it.—Mr. Edwards, a

number of species of the Nymphaline genus *Megalura* of South America, together with *Brassolis astyra* from Brazil.—Mr. H. Moore, immature examples of two species of Mantis from South Africa, and read notes on their habits. Mr. Edwards gave an account of a European Mantis he had kept alive for some time.—Mr. Adkin, a bred series of *Melanippe fluctuata* from Wantage, with the female parents. The latter were large and strongly marked, while the progeny were small and very ordinary. Mr. Adkin also showed specimens of *Crambus tristellus*, (1) almost albino from Pembroke, (2) dark from Perth, and (3) with two transverse lines from Orkney; all from the Barrett collection.—Mr. Clark, photo-micrographs of bacteria, × 1000.—Mr. Main, a nymph of *Periplaneta americana*, which was about to change to the perfect stage. —Mr. Turner read a paper by Mr. A. J. Croker and himself on a number of species taken by the former in Assiniboia, Canada, and exhibited among other species *Pontia protodice*, *Argynnis lais*, *Brenthis bellona*, *Colias eurytheme* and vars., *C. philodice*, *Erebia epipsodea*, *Satyrus alope* var. *nephele*, *Lycæna antiacis*, *L. dædalus*, *Cœnonympha pamphilus*, *Phyciodes ismeria*, &c.

April 26*th*.—The President in the chair.—Mr. W. Payne, of Clapham, Mr. P. Brown, of Balham, and Mr. D. Peyler, of Clapham, were elected members.—Mr. Kaye, the living larvæ of *Orgyia gonostigma*, and gave notes on their hybernation.—Mr. Moore, a number of species of Lepidoptera from Natal, including *Daphnis nerii*, *Agrius convolvuli*, *Hippotion celerio*, &c.—Mr. Edwards, a box of Lepidoptera from British North Borneo, and called attention to several species much resembling those of Great Britain.—Mr. Adkin, a number of series of *Aglais urticæ*, to point out the lines of variation shown by the species. In doing so he referred to the broods and series brought by Messrs. Harrison, Main, Turner, and others. Messrs. Harrison, Adkin, Bellamy, Kaye, Sich, Edwards, West, and Ashby then made remarks on the season to date.

May 10*th*.—The President in the chair.—Mr. Rayward exhibited series of *Hybernia marginaria* (*progemmaria*) from Liverpool and Surrey. The former were all dark, the latter had some of the females equally dark, but the males were only moderately dark.—Mr. Sich, living imagines of *Lithocolletis sylvella* from maple leaves collected at Cookham, in October, 1905, and kept in a flower-pot in the open.—A large number of lantern-slides were exhibited, (1) by Mr. Main, larvæ of *Agrotis ashworthii*, *Nisoniades tages*, *Apatura iris*, *Lucanus cervus*, and the pupa of a sawfly; (2) Mr. Lucas, for Mr. Hamm, illustrative of protective resemblance in *Tephrosia biundularia*, *T. luridata*, *Rumia cratægata*, *Cidaria miata*, *Pararge egeria*, &c.; (3) Mr. Tonge; (4) Mr. West (Ashtead); (5) Mr. Dennis; (6) Mr. F. Noad Clark.

May 24*th*.—The President in the chair.—Mr. Main, a nymph of the European *Mantis religiosa*, sent him by Dr. Chapman from Ste. Maxime.—Mr. Sich, an aberration of *Lithocolletis pomifoliella*, in which the median streak was connected with the first dorsal spot.—Mr. Carr, living larvæ of *Geometra vernaria*, some of which were still in their hybernating skins.—Mr. Kaye, living larvæ of *Thecla pruni*.—Mr. Tonge, a living specimen of *Eupithecia consignata*, just taken on Hayling Island.—Mr. Newman, a long bred series of *Brephos notha* from Worcester; *Polyommatus corydon* var. *fowleri*; an intermediate

form of *Colias edusa*; an extremely dark uniform form of *Ematurga atomaria*; a somewhat streaked *Chrysophanus phlæas*; results of interbreeding *Spilosoma lubricepeda*; and a fine series of bred *Notodonta trepida*.—Dr. Chapman, larvæ of *Thecla rubi*.—Hy. J. Turner, *Hon. Report Secretary*.

RECENT LITERATURE.

The Butterflies of the British Isles. (Wayside and Woodland Series.) By Richard South, F.E.S. London: F. Warne & Co.

There seems to be no end to books on butterflies, and especially on British butterflies. Those we have seen are good, bad, and indifferent, with perhaps some doubt as to the goodness. We are anxiously expecting to see Mr. Frohawk's, which we have reason to hope will be very good without any qualification. The one before us is perhaps the most excellent of its kind we have seen. It does not pretend to be an exhaustive scientific account of our butterflies, but is just the book that will supply the enthusiastic tyro with the information that he wants in a form he may depend upon.

The introductory matter is necessarily short, but deals clearly with the points it is desirable the young collector should know; and the account of each species deals similarly with the salient facts of each stage of the insect. It would be difficult to point out any errors of fact into which the author has fallen; and as to matters of opinion, we have met with nothing to disagree with, though we doubt very much, for instance, as to *Pyrameis atalanta*, whether he is right in considering this to be an immigrant in the same sense that *P. cardui* and *Colias edusa* are, though, assuming a desire to confute him, we cannot for the moment recollect any definite observation of its hybernating successfully in Britain, and can only rely on its being a fairly constant inhabitant of a very large part of our islands, and not varying to the extent they do between swarming and complete absence. The feature of the volume is the excellent series of plates. All the species are figured in both sexes, both surfaces, and often a good selection of varieties. The reproductions are apparently by a three-colour process, and are eminently successful. These processes always leave room for some criticism, but there is here as great a success as in many a more ambitious and expensive volume. The plain figures of the egg, larva, and pupa are especially to be noticed; they are a most valuable part of the account of each species, and are to be commended for their completeness, and for the most part for their accuracy and for the natural effect they produce, though without colour. We should have liked the source of these all to have been mentioned, as a guide to the young collector as to which he might thoroughly rely on. So far as we can guess, those that we find most thoroughly satisfactory are drawn by the artist from the life, or from good photographs; whilst those copied from previous figures vary immensely in merit. The eggs of the blues are very good, and the differences between the species are usually determinable. The larva of *atalanta* strikes us as having been done from life, but the example was too close to pupation for the pur-

pose; the result is, however, a good representation of the insect at one stage of its existence.

We should have liked the proper names of each species to have been at least as prominent as the English names. Doubtless this is a feature in which our author has had to conform to the real or supposed requirements of the public he is addressing; and since there obviously does exist a public that makes such a book possible, we can only accept with them their admitted prejudices.

Taking the book altogether, and making every allowance for inevitable inequalities, we do not know any work—not excepting the most expensive—yet issued on British butterflies that gives so full and accurate an account of them in all their stages. Indeed, we wonder how such a book can be offered at the price. It is excellently got up; the beautiful photograph, inside the cover, of *Cœnonmypha pamphilus* at rest is almost worth the money.

T. A. C.

Flies and Ticks as Agents in the Distribution of Diseases. (From 'The Proceedings of the Association of Economic Biologists.') By F. V. Theobald, M.A. 1905. Pp. 10.

A very useful paper, giving a synopsis of diseases having a similar origin to malaria, and of the small animals—flies, ticks, &c.—concerned in the propagation of such diseases.

W. J. L.

Report of Economic Zoology (1905). (South-eastern Agricultural College, Wye.) By F. V. Theobald, M.A.

In this particularly interesting and useful report of more than one hundred and twenty pages, with a very large number of illustrations contained in no less than forty-four figures, we see the result of a year's work that falls on the shoulders of Mr. Theobald at the important centre of agricultural study at Wye in Kent. Many of the very numerous foes (and friends), considered more or less fully according to circumstances, are insects; but we find besides, parasitic worms, molluscs, mice, and voles. There are also a few answers to extra-British enquiries. This notice is somewhat late in appearing, and we are looking forward to a new report of equal interest.

W. J. L.

A Preliminary List of Durham Diptera, with Analytical Tables. By the Rev. W. G. Wingate. Pp. i–vi, 1–416; plates i.–vii. Additions and corrections, 8 pp. London: Williams & Norgate. Newcastle-upon-Tyne: F. & W. Dodsworth. 1906.

This very useful work forms volume ii. (new series) of the 'Transactions' of the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne. The title it bears very inadequately conveys the actual scope and general value of the book. Practically it is an excellent guide to British Diptera, with the addition of localities for the six hundred odd species which the author had so far observed in Durham, and chiefly in the southern half of the county. There are numerous tables of genera and species, and these, in conjunction with

the Fly Chart on plate i., and description thereof on pp. 8–21, also other structural details on plates ii.–vii., should be exceedingly helpful to anyone desirous of taking up the study of this somewhat difficult Order.

Report of Work of the Experiment Station of the Hawaiian Sugar Planters' Association. Bulletin No. 1. Parts v. and vi. Leaf Hoppers and their Natural Enemies. Honolulu. Nov. 13th, 1905.

Part v. of this interesting Bulletin, of which parts i.–iv. were noticed Entom. xxxviii. 288, comprises pp. 165–181, with plates ix. and x., is by Mr. F. W. Terry, and refers to the Forficulidæ, Syrphidæ, and Hemerobiidæ. In part vi. (pp. 187–205, plates xi.–xiii.) the Mymaridæ, Platygasteridæ are dealt with by Mr. R. C. L. Perkins.

OBITUARY.

It is with very sincere and deep regret that I announce the death of my esteemed and valued friend Mr. F. G. Cannon, which occurred at his residence at West Hampstead, on June 7th last, at the early age of thirty-seven. He was the youngest son of Major Osborne Burwell Cannon, late of the 97th Regiment.

During the past few months his failing health gradually became more serious, which compelled him to give up his business duties as member of the Stock Exchange, and finally his case was pronounced hopeless, as rapid consumption set in a few weeks before passing peacefully away.

For seven years he was connected with the London Scottish Volunteer Regiment, in which he ranked high as a first-class marksman. Latterly, up to the time of his illness, he was in the Hon. Artillery Company Volunteer Regiment.

The whole of his leisure was given up to his favourite studies of ornithology and entomology. In both these branches he was a keen and accurate observer; also a successful collector, not only with the net, for he was expert with both shot-gun and rifle alike, being a good all-round sportsman, and endowed with remarkable perseverance and ability as a field naturalist. It is not the fortune of all entomologists at home to possess an almost complete collection of the British butterflies captured by their own hands; with the exception of *Lycæna acis*, *Vanessa antiopa*, *Argynnis lathonia*, *Pieris daplidice*, and *Anosia plexippus*, he had taken all the British species. It was his pleasure to make distant journeys, if only for a single day's collecting, in some remote district where a certain species might be met with on the wing; by so doing he made the acquaintance of all our rarer resident species in their native haunts, and many times I shared the pleasure with him.

His many friends found in him companionship of the highest qualities; his word, deed, and generosity were of the staunchest and noblest character. The great loss of his sincere friendship will be keenly felt by a very large circle of friends.

F. W. F.

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ON A FEW ORTHOPTERA COLLECTED IN SOUTHERN DALMATIA AND MONTENEGRO IN 1900.

By Malcolm Burr, B.A., F.E.S., F.L.S., F.G.S.

Having recently come across a few notes on some Orthoptera taken in Dalmatia and Montenegro in the summer of 1900, it occurred to me that they might be of sufficient interest to repay publication, if only for the sake of the localities, as little collecting is done in those countries. Want of time prevents me from working out all the material that I have been able to get together on the Orthoptera-fauna of the eastern shores of the Adriatic, but I hope at a later date to be able to make a more satisfactory contribution to our knowledge of the insects of these interesting countries.

As the neighbourhood is comparatively little known to British entomologists, the following notes on the localities may be of interest.

In Dalmatia, Traù is a small but ancient port in the northern part of the coast, and Sebenico is an important naval base not far from it; these two places were only visited during the brief call of the Austrian Lloyd steamer bound for Cattaro. The Bocche di Cattaro is the famous inlet of the sea in southern Dalmatia, recalling the finest scenery of the Scandinavian coast. Budua is a small walled town south of the Bocche. Castellastua is a small village some five hours' ride further south along the coast; Spizza is a tiny village at the extreme south of Dalmatia; it marks the limit of Austrian territory, for a few minutes' walk further south brings the traveller to the Montenegrin portion of the coast-line. Prisdan is a collection of cottages on the coast, which act as the port of Antivari, an important town about two miles inland; the latter has gained in importance since its annexation to Montenegro, and is the chief port of the principality. The Sutorman is a wooded pass over the Rumija range of mountains, which separate the Lake of Scutari from the sea. Podgoritza is an important commercial town on the east of the

same lake, ceded by Turkey to Montenegro in consequence of the Berlin Treaty; as its name implies, it is situated in the alluvial plain of the Zeta, at the foot of the savage Albanian Alps. Spuzh is an ancient stronghold in the valley of the Zeta, a few hours' journey east of Podgoritza. Dukle is the modern name for the ancient Dioclea, now a scattered heap of ruins, formerly the capital of the province of Prevalitana, famous as the birthplace of Diocletian, and the home of the anonymous priest to whom we are indebted for our scanty annals of the earliest Slav settlers. Danilograd is a modern town springing up in the heart of Montenegro, a few hours' journey north-east of Spuzh, on the road to Nikshich. Cetinje is the miniature capital of Montenegro, and Njegush, a little town half-way between Cetinje and the coast, birthplace of the reigning Prince of Montenegro.

These insects were taken on a trip that was undertaken more for pure travel than for entomology, which accounts for the somewhat meagre list of species included in these notes, of which the Phaneropteridæ and Decticidæ are the most interesting. No prolonged stay was made in any one locality except at Cetinje; the various other places were visited in passing on a tramp through the interior and up the coast.

The following are the dates at which the different localities were visited:—

Traù and Sebenico, July 27th; Bocche di Cattaro and Njegush, July 29th; Cetinje, July 30th, and various days early in August; Sutorman Pass, July 31st; Prisdan, August 1st; Spizza, August 2nd; Castellastua, August 3rd; Budua, August 4th; Spuzh, Dukle, and Danilograd, August 7th and 9th.

Ectobia livida, Fabr.—On the Sutorman Pass; one male.

E. lapponica, Linn.—On the Sutorman Pass; one female.

Acrida nasuta, Linn.—Common throughout the lowland country; at Traù, Sebenico, Spizza, Spuzh, and Danilograd.

Stenobothrus petræus, Bris.—This tiny grasshopper was abundant round Cetinje.

Stauroderus bicolor, Charp.—Abundant round Cetinje.

S. vagans, Fieb.—At Dukle.

Omocestus rufipes, Zett.—At Cetinje; not numerous.

Chorthippus dorsatus, Zett.—At Dukle and Spuzh.

C. pulvinatus, Fisch. de W.—At Antivari, Prisdan, Dukle, and Cetinje, but not very numerous.

C. parallelus, Zett.—Common at Cetinje, Sutorman, and Prisdan.

Arcyptera brevipenne, Br.—A few on the Sutorman Pass.

Epacromia strepens, Fabr.—Common on the low ground, at Traù, Dukle, Danilograd, and Prisdan.

Œdipoda cærulescens, Linn.—Common at lower elevations, at Spizza, at Cetinje, and on the hills above Antivari.

O. miniata, Pall.—On the higher ground, as a rule; at Sebenico and Danilograd.

Œdaleus nigrofasciatus, De Geer.—A few at Antivari.

Pachytylus danicus, Linn.—At Traù, Castellastua, and Prisdan.

Sphingonotus cærulans, Linn.—Abundant on the beach at Prisdan.

Acrotylus patruelis, Strum.—At Prisdan.

Acridium ægyptium, Linn.—At Prisdan, and near Antivari.

Podisma alpinum, Koll.—Common on the Sutorman Pass.

Platyphyma giornæ, Rossi.—Common at Dukle, round Cetinje, and in the Bocche.

Caloptenus italicus, Linn. — Common enough; at Danilograd, Spuzh, Sutorman, and in the Bocche.

Tettix subulatus, Linn.—A few at Prisdan.

T. bipunctatus, Linn.—Numerous round Cetinje.

T. depressus, Bris.—Numerous round Cetinje.

Pœcilimon ionicus, Koll.—One male and two females at Castellastua, and two males and a female at Prisdan.

P. affinis, Fieb.—A pair on the Sutorman Pass.

Barbitistes ocskayi, Yers.—A few on the Sutorman Pass and at Prisdan.

Tylopsis liliifolia, Serv.—Common nearly everywhere; at Prisdan, Castellastua, Sebenico, Traù, Sutorman, Antivari, and Spuzh; the variety *marginéguttata* occurred at Spizza.

Conocephalus nitidulus, Scop.—A few at Danilograd and Prisdan.

Rhacocleis discrepans, Fieb.—Widely spread, and not rare; common on the hillsides round Cetinje; also at Dukle, Prisdan, and Antivari; also at Traù.

Pachytrachelus striolatus, Fieb.—A few on the Sutorman Pass, and some immature specimens at Njegush.

P. frater, Br.—A pair at Dukle.

Platycleis grisea, Fabr.—A female at Njegush.

P. vittatus, Charp.—A few at Dukle and Prisdan.

P. sepium, Yers.—At Traù, Castellastua, and Prisdan; it is very active, and hard to catch; it seemed to occur most frequently at the foot of stone walls in the blazing sun; the great power of its long hind legs enables it to make tremendous leaps.

Olynthoscelis chabrieri, Charp.—This magnificent insect was numerous on thick clusters of thorns near Castellastua; it sits on the topmost twigs, and, being as nimble as it is wary, it is very difficult to capture.

O. fallax, Fisch.—On the hills above Antivari.

O. femoratus, Fieb.—A few on the Sutorman Pass, at Prisdan, Castellastua, and Danilograd.

O. dalmaticus, Krauss.—This species is even finer and more active than *O. chabrieri*, though less brightly coloured; it makes terrific springs, and frequently settles on the bare trunks of trees. I was never able to catch one with my net, but my Montenegrin servant succeeded in taking two with his bare fingers; they require some care in handling, as they are capable of inflicting a rather severe bite with their powerful mandibles.

Decticus verrucivorus, Linn. — Fairly numerous at Danilograd, but in these southern countries generally replaced by the following.

D. albifrons, Fabr.—This is a splendid insect. It is abundant amongst dry grass and shrubs; its stridulation is loud and prolonged, recalling that of *Locusta viridissima*, but even more strident. It is not difficult to stalk down, with care and patience.

Ephippigera sphacophila, Krauss.—Fairly numerous, crawling about shrubs in hot valleys. In the Bocche di Cattaro, at Castellastua, and Prisdan.

Œcanthus pellucens, Scop. — On the Sutorman, at Cetinje and Spuzh.

Arachnocephalus vestitus, Yers.—One female of this curious little cricket at Budua.

SOME POINTS IN THE LIFE-HISTORY OF *LYCÆNA ARION*.

By The Honourable N. Charles Rothschild.

It is with no small interest that entomologists have read Mr. Frohawk's interesting notes in the July number of this journal on the life-history of *Lycæna arion*. There are, however, several points which seem to require further elucidation, and which it is hoped Mr. Frohawk will investigate and ultimately settle.

From Mr. Frohawk's latest notes it would appear that the larva of *L. arion* only moults three times. This habit is unusual in the genus *Lycæna*, though present among several species of the genus *Thecla*. We do not think that Mr. Frohawk has completely proved this point, though the evidence he submits certainly points in this direction.

On a former occasion Mr. Frohawk has recorded that a larva of *Lycæna arion* (when in the autumn it refused to eat any more thyme) fed for many weeks upon a certain food he found apparently suitable to it. This would lead one to believe that the young larvæ do not hybernate at once after quitting the thyme, but are fed in the ants' nests; and in connection with this it may be mentioned that the larvæ of the ant (*Lasius flavus*) live through the winter, and are probably fed to some extent during the winter by the ants in the nests, a fate possibly shared with them by the young *arion* larvæ.

The larvæ of *arion*, however, may not be fed by the ants, but may feed on the vegetable refuse, &c., in the nest.

Finally, why is it so difficult to find these larvæ? The perfect insects are so numerous in North Cornwall that one would imagine that the larvæ must be quite common in their habitat, and this Mr. Frohawk did not find to be the case. Has the larva of *Lycæna arion* some curious method of concealment?

148, Piccadilly, London, W.: July 17th, 1906.

ON THE RECENT ABUNDANCE OF *PYRAMEIS CARDUI*, *PLUSIA GAMMA*, AND *NOMOPHILA NOCTUELLA*.

By Robert Adkin, F.E.S.

There can be no doubt as to the abundance of *Pyrameis cardui* in England during the spring of this year, but when and where the species was first seen, or indeed any details of the visitation, appear to be wanting, and the phenomenon is thus shorn of much of its interest. My own experience in the matter is but slight, and at best imperfect, owing to force of circumstances. I, however, give it for what it is worth; but many observers who live in country places, and are thus able to be in constant touch with what goes on around them, and habitually note the manners and ways of even our common species, could doubtless throw a good deal of light on the subject. Up to June 1st I had been constantly in London, and had therefore little chance of seeing whether *cardui* was with us or not; but on the evening of that day I arrived in Eastbourne. It was a very wet evening, and the following morning was cloudy and dull; the afternoon, however, came out bright, and while walking home along the parade I saw an evident Vanessid, which I took to be *cardui*, fly wildly up the bank which separates the parade from the roadway and disappear over the top.

The 3rd was a brilliant day, and leaving home directly after breakfast for a morning on the downs, I had to pass the long slopes that form the front of the cliffs towards the sea. In places these were a blaze of yellow blossom, owing to the bird's-foot trefoil (*Lotus corniculatus*), horseshoe vetch (*Hippocrepis comosa*), and kidney vetch (*Anthyllis vulneraria*), which here grow in huge masses, being at the height of their flowering. Crowds of *cardui* were feeding on the latter, but the *Lotus* and *Hippocrepis* appeared to offer no attraction to them. As the butterflies sat feeding on the flowers with the full sunshine upon their extended wings, the majority of them looked as though they were in the most perfectly fresh condition; but on capturing and examining a number of them, this was found to be by no means the case. Not only were the colours under closer inspection seen to be more or less faded, but the fringes showed very decided signs of wear, suggesting that the insects had been on the wing for a considerable time, yet very few of them showed any signs of mutilation.

In the adjacent "hollows" on the downs, *Plusia gamma* was simply swarming among the grass which here grows to perhaps a foot in height, and on the rougher ground *Nomophila noctuella* darted out of the tufts of scrubby grass in considerable numbers.

Several *gamma* also came to light in the house on the evening of this day.

The morning of the 4th was dull, but the sun came through by midday. During the afternoon I again visited the flowery slopes, and found *cardui* still feeding on the *Anthyllis*, but in smaller numbers than on the previous day, and by the 6th only a stray one or two could be found there, although the weather continued gloriously fine. But from this time up to the 21st, when I left the neighbourhood, wherever I went through the surrounding country for many miles round the species was seen, but only in very small numbers, seldom more than one or two at a time.

The disappearance of *gamma* was even more marked, as, although I was frequently over the same ground where I had found it so abundantly on the 3rd, it was rarely that even one was seen, except on the 17th, when perhaps half-a-dozen were noted during a long morning's collecting, and no more came to light at night. *Noctuella* was again seen on two occasions only, namely, a single individual each on the 10th and 17th.

The slopes where *cardui* was so abundant face almost due east. The prevailing wind when I reached Eastbourne was westerly, therefore blowing off the land, and I understand had been so for some days previously to my arrival; but it had not been stable, often shifting for a few hours or falling calm. On the morning of the 4th it veered into a light easterly sea breeze, and remained so for several days. Of the exact conditions of wind and weather prevalent at the time when the insects first became so abundant on the slopes facing the sea, I have therefore unfortunately no very definite record, but it will be noted that it was on the wind becoming permanently east that the dispersal of the insects that had congregated on the coast commenced.

The foregoing might conveniently be put into tabulated form, thus :—

LOCALITY.—Eastbourne, Sussex coast.

PERIOD OF OBSERVATION.—June 2nd to 21st, 1906.

SPECIES.—*Pyrameis cardui*, June 3rd, locally abundant; 4th, locally common ; 5th to 21st, generally distributed sparingly.

SPECIES.—*Plusia gamma*, June 3rd, locally abundant; 4th to 17th, very sparingly.

SPECIES.—*Nomophila noctuella*, June 3rd, locally very common; 4th to 17th, rarely.

A number of such brief tables got together would, without doubt, throw light upon a much discussed but none the less interesting subject.

Lewisham: July, 1906.

NOTES ON THE VEGETABLE CATERPILLAR OF NEW ZEALAND.

By Alfred Philpott.

At a meeting of the South London Entomological and Natural History Society, held on Oct. 26th, 1905, there was exhibited by Mr. Step a larva of the New Zealand vegetable caterpillar (*Hepialus virescens*), and the fungus (*Cordiceps robertsii*) which attacked it.

This insect-vegetable combination never fails to arouse interest, whether the beholder be a trained entomologist or an ordinary observer without any special predilection for the study of insects. It is unfortunate that but little is known of the caterpillar and its parasitic foe, still more unfortunate that several errors have crept into the little we know of its life-history. In almost every account of this curious abnormality it is stated that the insect is extremely rare, that it is found only under the rata-tree (*Metrosideros*), and that the caterpillar is the larval stage of the handsome green and white moth (*Hepialus virescens*). These three statements are all contrary to fact. The caterpillar has been found practically throughout New Zealand; in some cases—for instance, where alluvial gold-mining has been carried on—in great numbers. The dead and dry caterpillar is probably often overlooked, bearing as it does, even with the fungus-spike attached, a close resemblance to a fragment of a dead root. With regard to the larva's invariable association with *Metrosideros*, this is so far from being the case that in several districts where the larva has been commonly met with, the rata-tree is unknown. As to the moth into which the caterpillar would in the ordinary course of events develop, Mr. G. V. Hudson has pointed out ('New Zealand Moths and Butterflies,' p. 132) that the supposition that *H. virescens* is the imaginal form is certainly erroneous, as the larva of that species lives in stems of trees, and never goes underground, even to pupate, while the larva of the vegetable caterpillar is subterranean in its habits. Mr. Hudson suggests *Porina mairi* in place of *H. virescens*, but the extreme rarity of this moth renders it improbable. The type of *P. mairi* was discovered by Sir Walter Buller thirty-nine years ago, and I do not think that a second example has yet been brought to light. It is, I think, more probable that *Porina dinodes* will turn out to be the correct species. No other moth in this district (Southland) is large enough to warrant the assumption that its larva may be the host of the fungus. When full grown the larva of *dinodes* is nearly four inches long, and inhabits a tunnel driven in rather an oblique direction to a depth of fifteen to twenty inches. A comparison of fungus-

attacked larvæ with living larvæ of *P. dinodes* found within a few yards of each other, shows that the two are very similar, if not identical. It is of course possible—as Mr. Hudson suggests in a letter to me—that more than one species is attacked, and that the same species may not be selected in the North Island as in the South.

Underwood, Invercargill, New Zealand.

A NEW SPECIES OF *PSEUDAGENIA* FROM AUSTRALIA.

By P. Cameron.

Pseudagenia australis, sp. nov.

Black; the antennæ orange-yellow, the apical two or three joints infuscated above; a narrow line on the lower inner orbits, commencing opposite the antennæ, where it is united to a line of similar width, which goes round the sides and apex of the clypeus; mandibles yellowish testaceous from shortly beyond the middle to the teeth. Palpi black, paler at the apices of the joints, densely covered with short white pubescence; the anterior tibiæ are brownish in front; the four anterior calcaria black, the posterior white, narrowly black at the base; the longer one extends to shortly beyond the middle; wings clear hyaline; a narrow brownish, not very distinct, cloud along the transverse basal and the transverse median nervures; there is a cloud in the base of the radial cellule, in the second cubital, and between the recurrent nervures in front. ♂. Length, 9 mm.

Eyes slightly but distinctly converging above; the ocelli in a triangle, the hinder separated from the eyes by about one-half more than they are from each other. The eyes at the top are separated by about the length of the pedicle and third antennal joint united. Apex of clypeus broadly rounded. Face and clypeus densely covered with silvery pile, the cheeks less densely with long silvery hair. Temples roundly narrowed. There is a narrow interrupted furrow down the front. Pronotum roundly narrowed from the apex to the base; in the middle it is about two-thirds of the length of the mesonotum. The third abscissa of the radius is as long as the basal two united; the first recurrent nervure is received shortly beyond the middle, the second near the apex of the basal fourth of the cellule; the transverse median shortly beyond the transverse basal; the accessory in the hind wings shortly behind the cubitus. The first abdominal segment is long, becoming gradually wider towards the apex, where it is more than twice the width of the base; it is distinctly longer than the second segment, which is as wide at the apex as it is long; the segments in fresh examples are banded with silvery pubescence. Metanotum shagreened. The apices of the wings are slightly infuscated. The labrum appears to be obscure testaceous.

Allied to *P. fusciformis*, Sauss. Judging from Saussure's figure of that species, the present has both the temples and pronotum more largely developed than in *P. fusciformis* or *P. novaræ*, Sauss. Orange-yellow antennæ appear to be not uncommon with Australian Pompilidæ.

NEW AMERICAN BEES.—II.

By T. D. A. Cockerell.

Perdita jonesi, n. sp.

Runs in my tables to *P. octomaculata* and *affinis*, and is very closely allied to them, differing as follows:—

♀. Length, 5½–6 mm.; head and thorax dark blue-green, abdomen brown-black, with oblique chrome-yellow marks on sides of first four segments. It is a little smaller than *octomaculata*, the abdominal markings are smaller, the prothorax is without yellow spots, and the tubercles are either all dark or with minute yellow dots; the tegulæ are smaller, and light reddish brown instead of hyaline with a yellow spot; the wings are smoky and iridescent, with dark (solid brown) stigma and nervures; the outer border of the third discoidal cell is longer, and the marginal cell seems a little longer; the yellow of the front legs is reduced; the face is narrower, the black bars on the clypeus are much heavier, and the lateral face-marks are reduced, being subpyriform, pointed above. From *P. affinis* it is readily known by the longer and narrower marginal cell, the chrome-yellow abdominal spots, the unspotted prothorax, and the smaller lateral face-marks.

♂. Length scarcely 5 mm.; lateral face-marks rounder and less pointed above; abdomen spotted only on second and third segments. Runs in my tables to *P. affinis*, but the face-marks would agree better with the female than the male of that species, and even for that sex the lateral face-marks are much too small, and the black on the clypeus is much too heavy. The anterior femora, instead of being entirely yellow in front, are yellow only at the knees, while the middle and hind femora and tibiæ are not striped with yellow as they are in *affinis*.

♂, var. *a*. Similar, but the abdomen has yellow (reddened by cyanide in type) spots on the first five segments, the tubercles have a yellow spot, the lateral face-marks are much larger, the clypeus is yellow without well-defined black bars, and there is a subquadrate yellow supraclypeal mark. There are even minute dots representing the dog-ear marks. The knees are all yellow, and the anterior and middle tibiæ have heavy yellow stripes.

Hab. Rosser, Texas, June 7th, 1905; female (= type) and male taken by Mr. F. C. Bishopp at flowers of *Monarda citriodora*, and female and male, var. *a*, taken by Mr. C. R. Jones at flowers of *Parosela* (?). The male var. *a* may possibly be a distinct species, but the female taken with it agrees with the

other female. The species is quite distinct from *P. monardæ*, Viereck.

Perdita dallasiana, n. sp.

♂. Length just over 4 mm.; head and thorax rather yellowish green, marked with yellow; thorax, upper part of head, and cheeks conspicuously though not densely hairy; head round, cheeks normal; face entirely pale dull semipellucid yellow up to level of antennæ (this also including labrum, and mandibles except the extreme tip, which is reddish), the light colour having a broad but short angular projection upwards in the middle line, and on each side meeting the orbital margins at an angle of perhaps 50°, the apical point, however, sending a line upwards, which diverges a little from the eye; cheeks, except the upper part, yellow; antennæ light yellow beneath and dark above; front dullish; prothorax light yellow with a green transverse band, which reaches the hind margin for a short distance in the middle line; mesothorax rather shiny, the median groove very distinct; pleura with two yellow marks, one just behind the tubercles, and a larger transverse one lower down; legs very light yellow, marked with very dark brown; all the femora have large marks behind, as also do the tibiæ; tegulæ pellucid; wings very iridescent, with brown nervures, the stigma narrowly margined with brown; marginal cell ordinary; third discoidal cell weak; first five abdominal segments with broad dull yellow entire bands on a dark brown ground; those on segments two and three bend abruptly backwards at the sides, leaving a brown triangular antero-lateral corner on each side of the segment, and preventing the brown from reaching the lateral margins posteriorly; on segments four and five the lateral backward processes are wanting, and so the bands end some distance from the lateral margins; segments six and seven entirely yellow; ventral surface of abdomen entirely yellow, rather inclining to orange. Runs in my tables to *P. hirsuta*, Ckll., though the hair of the front, while arranged as in *hirsuta*, is not so conspicuously abundant. It may be known from *hirsuta* by the yellow line extending upwards at the sides of the face, the greater amount of yellow on cheeks, the marks on pleura, the colour of the hind legs, &c.

Hab. Dallas, Texas, on *Helianthus*, July 13th, 1905 (W. W. Yothers); also a specimen with the marking of the abdomen a little different, from Rosser, Texas, June 7th, 1905 (C. R. Jones).

Perdita xanthismæ sideranthi, n. subsp.

♀. Runs in my table (Proc. Phila. Acad. 1896) to *P. austini*, but is not related to that species. The form with a supraclypeal mark runs near *P. stolleri*, but differs by the higher clypeus, much duller mesothorax, &c. It differs from true *xanthismæ* as follows: dog-ear marks absent; supraclypeal mark absent, or rarely represented by a narrow transverse band; abdomen dark brown or practically black, with broad cream-coloured bands on segments two to five, these bands notched in the middle posteriorly; venter darker.

This certainly looks like a distinct species, but the abdomen is very variable, and the lightest specimens do not differ materi-

ally from the darkest from Goldthwaite, at flowers of *Xanthisma*. The wings, hairy thorax, &c., are the same.

Hab. Ennis, Texas, Sept. 27th, 1905; taken by F. C. Bishopp at flowers of *Sideranthus rubiginosus*—seven specimens. Also two taken by J. C. Crawford at Handley, Texas, Aug. 3rd, 1905, at flowers of *Isopappus divaricatus*.

Flowers visited by Perdita.

I have just received from Mr. Crawford the names of some of the flowers upon which the Texas species of *Perdita* were caught. The flowers were identified at the Department of Agriculture in Washington.

Perdita bishoppi and *P. cambarella* were at flowers of *Heterotheca subaxillaris*. *P. cambarella* is evidently close to *P. mellina*, which visits the *Heterotheca* in Arizona. The ornamentation of the male abdomen is practically the same in both, but the face-marks differ conspicuously.

P. jonesi was taken at flowers of *Monarda citriodora*; but *P. jonesi*, var. *a*, was from *Petalostemon multiflorus*.

At Barstow, Texas, July 22nd, Mr. Crawford took a variety of *Perdita verbesinæ* at flowers of *Verbesina encelioides*.

Boulder, Colorado: April 30th, 1906.

NEUROPTERA TAKEN IN FRANCE BY DR. T. A. CHAPMAN IN 1905 AND 1906.

By W. J. Lucas, B.A., F.E.S.

Dr. Chapman has given to me two small collections of Neuroptera, taken casually in France in July–August, 1905, and April–May, 1906, which contain the following insects:—

Lautaret, Hautes-Alpes, August 1st–10th, 1905.—*Æschna juncea*, one male, two females (dragonfly); **Dictyopteryx alpina*, one (Perlid); *Hemerobius quadrifasciatus* (brown lacewing).

Larche, Basses-Alpes, July 21st–30th, 1905.—**Rhyacophila vulgaris*, four males; **Drusus discolor*, one female; **Potamorites biguttatus*, one male (caddis-flies).

Hyères, April 2nd–18th, 1906.—**Sympycna fusca*, four males, three females; **Orthetrum brunneum*, one teneral male; *Brachytron pratense*, two males; *Sympetrum striolatum*, three males, one female, all teneral (dragonflies).

Gapeau, April 14th, 1906.—*Tinodes wæneri*, thirteen (caddis-fly).

S. Maxime, April 20th–May 10th, 1906.—*Pyrrhosoma nymphula*, one male (dragonfly); *Nemoura variegata*, two (Perlid); *Mesophylax aspersus*, one (caddis-fly).

Non-British species are marked with an asterisk (*); *M. aspersus* is probably only an accidental introduction into the British fauna. Mr. K. J. Morton has been good enough to assist in the identification.

Kingston-on-Thames.

A NEW GENUS AND FIVE NEW SPECIES OF ICHNEUMONIDÆ FROM AUSTRALIA.

By P. Cameron.

CRYPTINÆ.

PHYGADEUONINI.

Gavrana, gen. nov.

Areolet 4-angled, the nervures uniting in front; the cubitus obsolete beyond it. Disco-cubital nervure unbroken. Transverse basal nervure interstitial. Transverse cubital nervure in hind wings broken far below the middle. Scutellum roundly convex, broader than long; its sides stoutly keeled. Metanotum regularly areolated; the areola more than twice longer than wide, rounded at the base, transverse at the apex, which is narrower than the base; the spiracles small, twice longer than wide. Apex of clypeus transverse; labrum projecting. Mandibles bidentate; the upper tooth much longer than the lower. Abdominal petiole long and slender. The basal joints of the antennæ long; the third is distinctly longer than the fourth. Face not thickly covered with white pubescence. Parapsidal furrows not extended to the middle of mesonotum. Metanotum shining, rugosely punctured; it has five apical areæ. There are no dorsal keels on the first abdominal segment. The radius originates behind the middle of the stigma. Disco-cubital cellule at base much wider than the second discoidal cellule at the apex.

Belongs to the Phygadeuonini. In Dr. Ashmead's "System" (Bull. U. S. Nat. Mus. xxiii. 27) it would come near *Isotima*, Foer. It looks more like an Ichneumon than a Cryptid.

Gavrana maculipes, sp. nov.

Rufo-ferruginous; the front and vertex broadly, occiput except at the edges; antennæ except for a white ring of three joints beyond the middle, the sides of mesonotum narrowly, a broad line on the apical half in the centre, the parts surrounding the base and sides of scutellum, the space at the sides of post-scutellum, the base of metanotum narrowly, a broad line, dilated at the apex, in the centre of propleuræ, the parts round the tubercles, the sutures at the apex of the mesopleuræ, and more broadly at the base of mesopleuræ, the apex of the hind femora, their tibiæ more broadly, and the basal, second and apical joints of hind tarsi, black. The following parts are yellow: the eye-orbits—the hinder broadly below—face, clypeus, labrum, mandibles, palpi, the top and bottom of propleuræ, scutellar keels, apex of scutellum, post-scutellum, apex of metanotum laterally, the breasts, the base of meso-

pleuræ from the black line, its lower part broadly, apex of metapleuræ, the four anterior coxæ, trochanters and their femora, tibiæ and tarsi in front, and joints three and four of the hind tarsi. Wings hyaline, the stigma and nervures fuscous. ♂. Length, 9 mm.

Face and base of clypeus closely and somewhat strongly punctured; the apex of the latter smooth; the front and vertex are more closely punctured; there is a short narrow keel below the ocelli. Pro- and mesothorax closely punctured; the scutellum is more strongly and much more sparsely punctured. Metanotum closely, strongly, transversely striated; the base in the middle smooth; the areola irregularly, sparsely wrinkled; the apical areæ are more stoutly transversely striated; the posterior median almost smooth above, below sparsely striated; the lateral areæ have the striæ stout; the spiracular area is closely rugosely punctured. Abdominal petiole smooth and shining. Under side of tarsi spinose; the apices of the joints more stoutly spinose.

HEMITELINI.

Otacustes? rufipes, sp. nov.

Rufo-ferruginous; the mesothorax largely suffused with black; a narrow pale yellow line on the pronotum; the vertex, front, and occiput black, the orbits narrowly yellow; the red colour on the face and clypeus is suffused with yellow; legs coloured like the abdomen; the antennæ dark testaceous, the scape yellowish below, the flagellum black above. Wings hyaline, the costa and stigma fuscous, the nervures blacker. ♀. Length, 5 mm.

Front and vertex closely, uniformly punctured; there is a broad, short, curved furrow below the anterior ocellus. Face closely punctured, clearly separated from the clypeus; there is a narrow keel down the middle. Apex of clypeus broadly rounded, the margin depressed. Palpi yellowish. The basal two joints of flagellum equal in length. Thorax closely punctured, the pleuræ more strongly than the upper part. Areola wider than long, rounded at the base, transverse at the apex. Radial cellule small, the radius roundly curved, not reaching half-way to the apex. Areolet large; long, counting along the radius, wider in front than behind, receiving the recurrent nervure beyond the middle; the cubitus is obsolete beyond it; the second transverse cubital nervure is more distinct than is usual with the Hemitelini; the radius issues from beyond the middle; the stigma is large. Antennæ over 20-jointed. Second discoidal cellule closed. Metathoracic spiracles oval.

This is probably not a true *Otacustes*; in the generic tables given by authors it runs into that genus.

ICHNEUMONINI.

Probolus albocinctus, sp. nov.

Black; the legs, except the coxæ, trochanters, and the apex of the hind femora, and the second abdominal segment, red; the tenth to fifteenth joints of the antennæ, scutellum, except at the base, an interrupted band on the apex of the third abdominal segment and the penultimate, white; wings hyaline, the stigma testaceous, the nervures black. ♀. Length, 13 mm.

Head strongly punctured, the front and vertex more closely and regularly than the face. Face and oral region thickly covered with pale hair. Scutellum shining, weakly punctured, flat. Thorax closely, somewhat strongly punctured, the median segment more coarsely than the rest. Areola quadrate, almost twice longer than wide, of equal width throughout, transverse at the base and apex. Post-petiole strongly, regularly, longitudinally striated, the central area clearly defined. Gastrocœli transverse, stoutly striated, the striæ mostly curved, clearly separated. Areolet 5-angled, wide in front, as wide there as the space bounded by the recurrent and the second transverse cubital nervures; the recurrent is received shortly beyond the middle; the disco-cubital is broken by a stump; the transverse median nervure is received distinctly beyond the transverse basal. Tarsi spinose, especially at the apices of the joints. Tubercles white. Temples longer than the eyes above. Occiput roundly incised. The apex of the hind tibiæ may be black.

ANOMALONINI.

Anomalon trichiosomum, sp. nov.

Black; the first abdominal segment, the sides of the second to fourth, and the hind legs rufo-testaceous; the four anterior legs yellowish testaceous; all the coxæ and the apex of the hind tibiæ broadly and irregularly black; the middle joints of the hind tarsi are tinged with yellow, the last black. There is a large yellowish mark on the centre of the face, dilated laterally in the middle to the eyes, the dilated parts gradually narrowed to a point on the outer side; there is a similarly coloured transverse mark on the clypeus, which is, laterally, gradually narrowed to a point. Mandibles with a pale yellowish mark in front at the base. Palpi pale yellow. Wings hyaline, iridescent, the costa and nervures black, the stigma testaceous. ♀. Length, 22 mm.

Head, thorax, and base of legs densely covered with long grey pubescence, the rest of the legs and body with a sparser and shorter whitish pile. Front depressed, the parts bordering the sides of the ocelli stoutly striated, the striæ oblique and twisted; the centre of the front is irregularly, stoutly reticulated; above the antennæ is a stout plate. Sides of face irregularly, coarsely reticulated, the centre irregularly rugose. Mesonotum smooth and shining, the apical slope in the middle closely, irregularly, longitudinally striated. Scutellum coarsely, rugosely punctured, with a smooth spot in the centre; it has an oblique slope towards the apex. Median segment coarsely, irregularly reticulated, densely covered with long pale hair. Pro- and mesopleuræ moderately finely but not closely punctured; the metapleuræ much more closely, regularly, and strongly punctured. Sheaths of ovipositor rufo-testaceous, black above; its basal third narrowed above, clearly separated from the thicker apical part. Transverse median nervure received shortly beyond the transverse basal; the transverse median nervure in the hind wings is broken shortly above the middle.

Laphyctes? trilineatus, sp. nov.

Black; a line on the inner orbits from the antennæ to the base of the mandibles, the line narrowed at the top and bottom, a line in the

middle of the face, becoming gradually widened below, where it is united to the clypeus, the clypeus, mandibles, except the teeth, palpi, and malar space, except in the centre, yellowish testaceous; the abdomen ferruginous, the second segment on the top, and the last two broadly on the top and on the sides, black. Four front legs yellowish testaceous, their femora more rufous in colour, the coxæ black; the hind coxæ, trochanters, apical half of tibiæ and metatarsus, except at apex, black; the femora and basal half of tibiæ rufous; the apex of metatarsus and the other joints of tarsi yellow. Wings hyaline, the base of costa testaceous; the rest of it, the front of stigma, and the nervures black; the posterior part of stigma testaceous. ♀. Length, 17 mm.

Head and thorax densely covered with white pubescence. Front and vertex closely, rugosely punctured, the centre weakly, obliquely striated. Face strongly, closely punctured, more closely on the sides than on the middle. Thorax closely, distinctly punctured, and densely covered with short white pubescence. Parapsidal furrows narrow, but distinct. Scutellum much more strongly punctured than the mesonotum; the punctuation on the apical slope running into longitudinal striæ. Median segment coarsely, irregularly, transversely reticulated. Transverse median nervure interstitial; the recurrent nervure is received very shortly beyond the transverse cubital. Transverse median nervure in hind wings broken distinctly below the middle. Parallel nervure broken shortly below the middle.

This is not a typical *Laphyctes*, but there is no other known genus in which it can be placed. The apex of the clypeus ends in a distinct point or tooth. The eyes converge slightly below; the malar space is very small. The upper tooth of the mandibles is a little longer than the lower. The short spur of the hinder tibiæ is twice longer than the width of the metatarsus. The antennæ are as long as the head, thorax, and basal two segments of the abdomen united. The sides of the clypeus above are bordered by deep oblique furrows; there is a short not very distinct furrow in the middle above. The base of the third discoidal cellule is not so wide as the length of the transverse median nervure.

THE LEPIDOPTERA OF THE DORKING DISTRICT.

By F. A. Oldaker, M.A.

(Concluded from p. 160.)

Porthesia similis. Larvæ common on whitethorn, May 28th; spun up, June 16th. Imagines, July 7th, Also taken freely at the lamps.

Dasychira pudibunda. Common at the lamps, June 12th. Larvæ also frequently taken. Imagines, April 23rd.

Orgyia antiqua. Larvæ very common on all kinds of food-plant, especially on wistaria in my garden. Larvæ, May 27th; spun up, July 15th. Imagines, August 30th.

Pœcilocampa populi. Taken at the lamps, November 10th. Ova deposited, November 26th. Larvæ, March 31st, died.

Malacosoma neustria. Common at the lamps, July 22nd. Larvæ, April 6th; spun up, June 30th. Imagines, July 16th.

Lasiocampa quercus. Fairly common on Ranmore. Spun up, May 16th and August 2nd. Imagines, June 5th.

Gastropacha quercifolia. Larvæ found on whitethorn at Polesden; spun up May 23rd. Imagines, June 30th.

Drepana lacertinaria. Caught by beating at Polesden, June 6th.—*D. falcula.* Common at the lamps in Dorking, May 28th. Larvæ, June 13th; pupated, July 7th. Imagines, July 17th.—*D. cultraria.* Caught by beating at Polesden, May 27th.

Dicranura vinula. Larvæ common on sallows, and imagines on the lamps in Dorking. Ova deposited, May 30th. Larvæ, June 25th; spun up, July 23rd. Imagines, May 18th.

Pterostoma palpina. Taken at the lamps in Dorking, May 23rd.

Lophopteryx camelina. Taken at rest on palings, June 6th. Larvæ beaten from oak, August 6th. Imagines, September 2nd.—*L. carmelita.* One specimen taken at a lamp in Dorking, May 1st.

Pheosia tremula (*dictæa*). Common at the lamps in Dorking, May 7th.—*P. dictæoides.* Taken sparingly at the lamps, May 31st and September 4th.

Notodonta trepida. Taken in some numbers at the lamps in Dorking. May 3rd.—*N. trimacula.* One specimen taken at a lamp in Dorking, May 23rd.

Phalera bucephala. Common at the lamps and at rest. May 23rd.

Habrosyne derasa. Taken at the lamps in Dorking, July 17th.

Cymatophora duplaris. Taken at the lamps in Dorking. July 16th.

Polyploca flavicornis. Taken at the lamps in Dorking, April 14th.

Bryophila perla. Very common at the lamps in Dorking. June 27th.

Acronycta psi. Larvæ common on many trees. Pupated, October 1st. Imagines, May 26th.—*A. aceris.*—Taken at the lamps. July 18th.—*A. megacephala.* Taken at the lamps. July 17th.

Diloba cæruleocephala. Very common at the lamps, October 19th.

Leucania conigera. Fairly common at the lamps. July 17th.—*L. lithargyria.* Taken at the lamps, July 11th.—*L. comma.* Common at the lamps. June 16th.—*L. impura.* Taken at the lamps. July 12th.—*L. pallens.* Common at the lamps. July 1st.

Nonagria arundinis. One specimen taken at a lamp, October 12th.

Hydræcia micacea. Common at the lamps. September 26th.

Xylophasia rurea. One specimen taken at a lamp, June 20th.

Dipterygia scabriuscula. One specimen flew into the dining-room to the gas, June 15th.

Neuria reticulata. One specimen taken at a lamp, June 24th.

Epineuronia popularis. Taken freely at the lamps. September 4th.

Charæas graminis. Taken at the lamps, July 30th.

Cerigo matura. Common at the lamps. July 22nd.

Luperina testacea. Very common at the lamps. September 4th.—*L. cespitis.* One specimen taken at a lamp, July 16th.

Mamestra brassicæ. Taken at the lamps, July 16th. Imagines from dug pupæ, June 15th.—*M. persicariæ.* Very common at the lamps. July 17th. Ova deposited, July 18th. Larvæ, July 24th. Imagines, June 2nd.

Apamea didyma. Common at the lamps. August 25th.

Miana strigilis. Taken at the lamps. July 25th.—*M. fasciuncula.* Taken at the lamps. June 27th.—*M. bicoloria.* Taken at the lamps. June 30th.—*M. arcuosa.* Taken at the lamps. July 18th.

Grammesia trigrammica. Common at the lamps. May 31st.

Caradrina morpheus. Very common at the lamps. June 4th.

Rusina tenebrosa. Taken at the lamps. June 21st.

Agrotis puta. Common at the lamps. May 18th.—*A. segetum.* Common at the lamps. July 1st.—*A. exclamationis.* Very common at the lamps, June 11th.—*A. corticea.* Taken at the lamps. June 28th. ——*A. cinerea.* Males taken in fair numbers at the lamps; once I took five off one lamp, but no females. May 28th.—*A. nigricans.* Taken at the lamps. July 1st.—*A. tritici.* Taken at the lamps. July 20th.—*A. strigula.* Taken at the lamps. August 4th.

Noctua plecta. Taken at the lamps. July 4th.—*N. c-nigrum.* Common at the lamps. September 29th.—*N. xanthographa.* Common at the lamps. July 16th.

Triphæna pronuba. Taken commonly at rest. June 28th.—*T. ianthina.* Taken at the lamps. July 23rd.—*T. comes.* Taken at the lamps. June 25th.

Amphipyra pyramidea. Taken at the lamps. July 24th.—*A. tragopogonis.* Taken at the lamps. July 20th.

Mania typica. Caught beating on Ranmore, July 15th.—*M. maura.* Flew into the dining-room, July 10th.

Pachnobia rubricosa. Taken at the lamps, May 8th.

Tæniocampa gothica. Taken at the lamps. March 21st.—*T. incerta, T. stabilis, T. munda.* Taken at the lamps. March 26th.—*T. pulverulenta.* Taken at the lamps. March 21st.

Orthosia lota. Taken at the lamps, November 1st.—*O. macilenta.* Taken at ivy-blossom, October 28th.

Anchocelis pistacina. Taken at the lamps, September 25th; ivy, October 29th.—*A. lunosa.* Common at the lamps. September 12th.

Cerastis spadicea. Taken at ivy-blossom, October 28th.

Scopelosoma satellitia. Taken at the lamps, November 1st.

Xanthia citrago. Taken at the lamps, October 11th.

Calymnia trapezina. Larvæ beaten from oak on Ranmore; imagines, July 12th.

Dianthœcia carpophaga. Taken at the lamps, June 21st.

Aporophyla lutulenta. Taken at the lamps, September 21st.

Miselia oxyacanthæ. Larvæ beaten from whitethorn on Ranmore; imagines, October 10th. Taken from ivy-blossom, October 28th lamps, October 19th.

Phlogophora meticulosa. Taken from lamps, May 30th, November 5th; ivy-blossom, October 28th.

Aplecta prasina. Flew into dining-room, June 20th.

Hadena protea. Larvæ beaten on Ranmore; imagines, September 10th.—*H. dentina.* Common at the lamps. June 17th.—*H. oleracea.* Common at the lamps. July 1st. Ova deposited, July 2nd. Larvæ, July 26th; pupated, September 17th. Imagines, June 8th. Fed on geranium.—*H. pisi.* Taken at the lamps. June 29th.

Gonoptera libatrix. Larvæ beaten from oak on Ranmore; imagines, July 27th.

Habrostola tripartita. Taken at the lamps, June 20th.

Plusia moneta. Taken at the lamps, July 14th.—*P. chrysitis.* Taken at the lamps, July 5th.—*P. iota.* Taken at the lamps, July 18th.—*P. gamma.* Common at lamps and on Ranmore. June 7th.

Anarta myrtilli. Taken on Ranmore, July 6th. Larvæ found at night, August 4th. Imagines, May 19th.

Acontia luctuosa. Taken in fair numbers on the south side of Ranmore. May 18th.

Phytometra viridaria. Common at Polesden. May 19th.

Euclidia mi. Common at Polesden. May 19th.—*E. glyphica.* Common at Polesden and Dorking. May 18th.

Catocala nupta. Common at Dorking. July 7th.

Laspeyria flexula. Two specimens taken at Polesden, July 12th.

Zanclognatha grisealis. Taken at the lamps, July 1st.—*Z. tarsipennalis.* Taken at the lamps, May 28th.

Hypena proboscidalis. Taken at the lamps in Dorking, July 14th. Beaten on Ranmore, June 29th.

Urapteryx sambucaria. Quite common at the lamps in Dorking. July 9th.

Epione apiciaria. Taken at lamps, September 4th; deposited same day. Larvæ, May 31st; spun up, July 8th. Imagines, July 16th.

Opisthograptis luteolata. Very common everywhere. May 15th.

Venilia macularia. Beaten on Holmwood Common and on Ranmore. May 25th.

Metrocampa margaritaria. Fairly common at the lamps and at rest. June 29th. Deposited, July 9th. Larvæ, July 19th. Imagines, June 24th.

Eurymene dolabraria. Beaten on Ranmore, June 18th.

Selenia bilunaria. Common at the lamps. March 26th and July 26th. Larvæ, May 20th; spun up, June 10th. Imagines, June 29th. —*S. lunaria.* Taken at the lamps, May 28th.

Gonodontis bidentata. Common at the lamps. May 18th.

Crocallis elinguaria. Taken at the lamps, July 25th.

Ennomos alniaria. Very common at the lamps. August 31st. Larvæ, May 9th; pupated, July 5th. Imagines, July 15th.—*E. fuscantaria.* Taken at the lamps, August 27th. Larvæ, May 19th; pupated, June 21st. Imagines, July 19th.

Himera pennaria. Common at the lamps. October 30th. Larvæ, March 19th; pupated, May 3rd. Imagines, November 11th.

Phigalia pedaria. Taken at lamps, February 8th.

Amphidasys strataria. Common at the lamps. March 20th. Deposited, April 14th. Larvæ, May 20th; pupated, July 17th. Imagines, March 7th.—*A. betularia.* Common at lamps. June 6th. Larvæ, July 6th; pupated, August 20th. Imagines, June 4th.

Hemerophila abruptaria. Taken at the lamps, May 15th.

Boarmia repandata. Beaten on Ranmore, July 4th.—Var. *conversaria.* July 19th.—*B. gemmaria.* Taken at the lamps, July 7th.—*B. consortaria.* Taken at the lamps, June 5th.

Tephrosia crepuscularia. Taken at the lamps, May 10th.

Pseudoterpna pruinata. Beaten on Holmwood Common, July 15th.

Geometra vernaria. Beaten on Ranmore, July 16th.

Hemithea viridata. Beaten on Ranmore, June 17th.—*H. strigata.*

Beaten on Ranmore, July 6th. Imagines from beaten larvæ, June 18th.

Ephyra punctaria. Beaten in Dorking, June 29th.—*E. annulata.* Beaten on Holmwood Common, May 20th.—*E. pendularia.* Taken at the lamps, May 31st.

Asthena luteata. Beaten at Polesden, June 4th.—*A. candidata.* Beaten on Ranmore, May 24th.

Acidalia dilutaria, A. virgularia. Taken at the lamps. June 14th. —*A. ornata.* Common at Polesden and on the south side of Ranmore. June 4th and August 10th.—*A. subsericeata.* Taken at the lamps, July 1st.—*A. remutaria.* Beaten at Polesden, June 3rd.—*A. imitaria.* Taken at the lamps, July 16th.—*A. aversata.* Taken at the lamps, July 4th.

Deilinia pusaria. Very common at lamps and by beating. June 11th. Imagines from beaten larvæ, May 31st.—*D. exanthemata.* Common on Ranmore. June 10th. Imagines from beaten larvæ, June 4th.

Bapta temerata. Beaten on Ranmore, May 17th.—*B. taminata.* Beaten on Ranmore, June 4th.

Macaria liturata. Beaten at Polesden, June 24th.

Thamnonoma vauaria. Taken at the lamps, July 6th.

Strenia clathrata. Taken at the lamps, May 24th.

Panagra petraria. Taken at the lamps, May 20th.

Ematurga atomaria. Beaten at Polesden, June 3rd.

Bupalus piniaria. Taken on Ranmore, June 1st.

Minoa murinata. Taken at the lamps, July 11th.

Abraxas grossulariata. Very common everywhere. Larvæ on red currant and *Euonymus*; pupated, June 14th. Imagines, July 5th. Light variety taken, July 25th.

Ligdia adustata. Taken at the lamps, May 21st.

Lomaspilis marginata. Taken at the lamps and beaten at Polesden, May 27th.

Hybernia rupicapraria. Taken at the lamps, February 13th.—*H. leucophæaria.* Taken at the lamps, March 8th.—*H. aurantiaria.* Taken at the lamps, November 13th.—*H. marginaria.* Taken at the lamps, February 13th.—*H. defoliaria.* Taken at the lamps, October 19th.

Anisopteryx æscularia. Taken at the lamps, March 8th.

Cheimatobia brumata. Swarming at the lamps. November 1st.

Oporabia dilutata. Common at the lamps. October 19th.

Larentia viridaria. Common on Ranmore. June 2nd.

Emmelesia alchemillata, E. unifasciata. Taken at the lamps, July 1st.

Tephroclystia linariata. Taken at the lamps, July 18th.—*T. oblongata.* Taken at the lamps, May 18th, August 15th.—*T. subfulvata.* Taken at the lamps, July 23rd.—*T. scabiosata.* Taken at the lamps, July 18th.—*T. satyrata.* Beaten at Polesden, May 24th.—*T. castigata.* Beaten at Polesden, June 2nd.—*T. pusillata.* Beaten at Polesden, May 24th.—*T. vulgata.* Taken at the lamps, July 10th.—*T. absinthiata.* Taken at the lamps, June 16th.—*T. minutata, T. assimilata.* Taken at the lamps, July 15th.—*T. exiguata.* Taken at the lamps, May 31st. —*T. sobrinata.* Beaten on Ranmore, July 27th.—*T. pumilata.* Taken at the lamps, May 23rd.

Lobophora viretata. Taken at the lamps, May 29th.

Thera variata. Taken at the lamps, June 20th.

Hypsipetes sordidata. Taken at the lamps, June 22nd.

Melanthia bicolorata. Taken at the lamps, July 18th.—*M. ocellata.* Beaten on Ranmore, June 11th.—*M. albicillata.* Taken at the lamps, July 17th.

Melanippe procellata. Beaten on Ranmore, July 9th.—*M. unangulata.* Beaten on Ranmore, June 17th.—*M. rivata.* Beaten on Holmwood Common, June 7th.—*M. sociata.* Beaten on Holmwood Common, May 25th.—*M. montanata.* Beaten on Ranmore, May 31st.—*M. fluctuata.* Common everywhere, April 27th.

Anticlea cucullata. Beaten on Ranmore, July 27th.—*A. badiata.* Taken at the lamps, March 25th.

Coremia ferrugata. Taken at the lamps, May 10th.—*C. unidentaria.* Taken at the lamps, May 24th.

Camptogramma bilineata. Common everywhere. June 3rd.

Phibalapteryx vitalbata. Taken at lamps, May 8th.

Eucosmia certata. Taken at lamps, May 14th.

Scotosia vetulata. Beaten on Ranmore, June 12th.

Cidaria truncata. Taken at the lamps, September 25th.—*C. suffumata.* Beaten on Ranmore, and taken at the lamps. May 31st.—*C. fulvata.* Very common on Ranmore, June 4th.—*C. dotata.* Taken at the lamps, July 4th.—*C. associata.* Taken at light, July 8th.

Pelurga comitata. Taken at lamps, June 21st.

Eubolia cervinata. Taken at lamps, September 24th.—*E. limitata.* Beaten in Dorking, July 26th.—*E. plumbaria.* Taken at lamps, June 15th.—*E. bipunctaria.* Taken on the south side of Ranmore, June 30th.

Anaitis plagiata. Beaten at Polesden, May 4th.

Chesias spartiata. Taken at lamps, October 12th.

January 27th, 1906.

NOTES AND OBSERVATIONS.

An Entomological Hoax (?).—I think the following facts may be of some interest to you. I was on Ranmore Common on June 26th, and in one spot found several pupæ, which appeared to be those of *Papilio machaon*, pinned to the tree-trunks. Three of the cases were empty, and the others had not emerged. I went to the common again on July 7th, and whilst I was resting, my little niece, who was with me, took my net to see if she could catch something, and to my surprise she soon returned with a specimen of *Limenitis sibylla*. I went to the spot where she found it, and after waiting for some time I saw another, but it was flying round a tree just out of reach, and soon went away out of sight; although I kept a good look-out I did not see any more. I exhibited the specimen at the South London Society on Thursday last, and the general opinion was that whoever had put the *Papilio* pupæ there had also introduced the *Limenitis*. I might mention that the place where *L. sibylla* was taken was far away from the spot where I found the *P. machaon* pupæ, and I did not have time to go and look at the latter again.—Arthur W. Dods; 97, Darenth Road, Stamford Hill, N., July 16th, 1906.

JOINT COCOONS.—In breeding *Bombyx castrensis* this year I have three times found two pupæ in one cocoon, *i. e.*, not merely two cocoons joining one another, but two pupæ actually touching each other as they lay side by side in a single large covering of silk. Evidently the larvæ worked in concert with some degree of intelligence. Their heads pointed in the same direction, and one opening served for both to emerge. I have not seen this noticed before. Is it a known habit?—W. CLAXTON; Navestock Vicarage, Romford.

SESIA CULICIFORMIS, VARIETY.—Last spring I obtained pupæ of *S. culiciformis* from two woods in Worcestershire, and on May 27th was surprised to see a fine specimen with no trace of a belt of any colour, and absolutely without the usual red and golden coloration on the wings. The palpi, too, are black; in fact, the insect has no sign of other colour than purplish black. I should be interested to hear if there are other specimens of this variety in existence. All my other specimens so far are of the ordinary type.—H. V. PLUM; Epsom College, May 29th, 1906.

EPHEMERA LINEATA.—On July 16th last a young entomological friend, Master J. Edwards, gave me a specimen of this may-fly, which he took on the wing the evening before at Knight's Park, Kingston-on-Thames. In previous years I have received one or two odd specimens from Kingston, Surbiton, Teddington, and Walton-on-Thames. Eaton, in his Monograph (Trans. Ent. Soc. Lond. 1871), gives the Thames and the Kennet near Reading as its British localities. Possibly this one spent its early days in the Hogg's Mill Stream, which passes through Kingston on its way to join the Thames. The species is distinguished with no great difficulty by means of the linear marks on the dorsal surface of the abdomen. It is later in emerging and somewhat larger and paler than the common may-fly, *Ephemera vulgata*. The remaining British species of the genus, *E. danica*, apparently prefers faster cooler streams.—W. J. LUCAS; Kingston-on-Thames.

ERRATUM.—In my note on *Orobena straminalis* (*ante*, p. 118), I see that "Bletchworth" is printed instead of "Betchworth."—H. V. PLUM.

CAPTURES AND FIELD REPORTS.

DEILEPHILA (PHRYXUS) LIVORNICA, &c., IN DORSETSHIRE.—I note the report of my captures of *D. livornica* and *Heliothis peltigera* in your valuable paper of this month (*ante*, p. 162), but I forgot to add that they were taken in the Dorset portion of Bournemouth—*i.e.* Branksome—not Hampshire. Would you kindly notify this for county references in your next issue?—W. G. HOOKER; 125, Old Christchurch Road, Bournemouth, July 14th, 1906.

LARVA OF DEILEPHILA (PHRYXUS) LIVORNICA IN SUSSEX.—A larva of a hawk-moth, which I believe to be *D. livornica*, was found in a sunny garden in Lewes, and brought to me yesterday. It was reposing for change into its last (?) skin. Probably others are to be found this year

if searched for. It is said to feed on vine, fuchsia, *Galium*, and *Rumex*, and to be probably polyphagous.—F. MERRIFIELD; 14, Clifton Terrace, Brighton, July 21st, 1906.

On July 18th, at 8.30 p.m., I took a fine specimen of *D. livornica* flying round *Delphinium*. I have heard of two others being obtained in Brighton this summer.—F. S. PARDOE; Belvedere, Upper Drive, Brighton, July 21st, 1906.

DEILEPHILA LIVORNICA IN CO. CORK.—To add to the localities (*ante*, p. 161) of the visit of this moth to these islands this year, I send a notice of the capture of a specimen at Schull, in the west of the county, on June 8th, hovering at dusk over flowers of honeysuckle. Another one was seen by me, but not secured, at the same locality on the 10th of the same month.—(Major, I.M.S.) C. DONOVAN; Passage West, Co. Cork, July 7th, 1906.

PHIBALAPTERYX POLYGRAMMATA.—I send you notice of the capture of a specimen of *Phibalapteryx polygrammata*, which I took in a field near here on the evening of July 1st. It was slightly worn. Is not this rather late for this insect? E. Newman gives March and September as the months for this moth. — (Captain) B. TULLOCH; Broom Villa, Strensall, York, July 2nd, 1906.

DICYCLA OO *var.* RENAGO IN ESSEX.—With reference to the distribution of var. *renago* of *Dicycla oo* (*ante*, pp. 128 and 161), I fancy it is to be found wherever the type occurs freely. In one of its Essex localities, where some seasons I take the species commonly, about ten per cent. are usually of the variety. — GEO. T. PORRITT; Huddersfield, July 4th, 1906.

DICYCLA OO.—With reference to the remarks that have appeared about this moth, it may be worth while to note that five or six years ago both *oo* and *renago* were abundant in this locality, but have not appeared since until this evening, July 11th, when I have just taken a specimen of *renago* in my garden.—W. CLAXTON; Navestock Vicarage, Romford, Essex.

OROBENA STRAMINALIS IN SURREY.—On July 24th last Master Norman Riley kindly brought me a few "Micros" that he had boxed from a fence in the Carshalton district. Among them was a fine example of *O. straminalis*.—RICHARD SOUTH.

SIREX GIGAS.—On July 2nd a fine male specimen of *Sirex gigas* was caught by Mr. Thomas Clayton in the waggon shop at the ironworks, Barrow-in-Furness. Last year one was caught in the shipyard, on June 9th, and is in my possession. — C. E. MORGAN; East Mount, Barrow-in-Furness.

A UNIQUE EXPERIENCE.— Two nights ago I was sugaring in my garden, which contains several species of poplar. At 9.45 I saw and boxed, on a Scotch-fir trunk, a beautiful male specimen of *Cymatophora octogesima*. Knowing it to be rather skittish, I rushed indoors and put it in a cyanide bottle. On my return to the tree I could hardly believe my eyes when I saw on the same patch of sugar another lovely

C. octogesima. This, which turned out to be a female, I also succeeded in boxing. Although I have occasionally taken it here before, it is always scarce, as I believe to be the case wherever it occurs.—(Rev.) Gilbert H. Raynor; Hazeleigh Rectory, Maldon, June 27th.

SOCIETIES.

The South London Entomological and Natural History Society. *Thursday, June 14th*, 1906.—Mr. R. Adkin, F.E.S., President in the chair. — Mr. Penn-Gaskill exhibited a dark suffused specimen of *Tephrosia biundularia* from the Midlands.—Mr. West, examples of *Euclidia mi* and *E. glyphica*, taken in his garden at Ashtead. — Mr. Sich, an assemblage of thirty-nine pupæ of *Pieris brassicæ*, which had been formed in a tumbler placed with the larvæ in the breeding-cage. Light and dark specimens were intermixed at random.—Mr. Lucas, a female example of the snake-fly, *Raphidia notata*, from the Black Pond, Esher; and also a very sparsely marked example of the scarce scorpion-fly, *Panorpa germanica*, from Haslemere.—Mr. Carr, pupæ of *Porrittia galactodactylus* from Horsley.—Mr. F. Noad Clark, on behalf of Mr. Griffiths, a plant of the local *Potentilla argentea* from Chalfont Road, and ova of *Hadena pisi*.—Mr. Tonge, clusters of ova of *Pachetra leucophæa*, which had been found at night on grass-stems, with the female sitting just above them.—Mr. Bellamy read a paper entitled "The Spring in the New Forest, and Whitsuntide Experiences."—Several members reported that *Phryxus livornica* had been met with in a few places, and that *Pyrameis cardui* and *Plusia gamma* were common in some parts of the South of England, and were moving on.

June 28th.—The President in the chair.—Mr. McArthur exhibited specimens of *Dicranura furcula* and *Axylia putris*, taken around the electric lights at Hammersmith. He noted at the same time numbers of *Triphæna pronuba*, *Agrotis exclamationis*, and *Noctua plecta*. He also showed the pupa of *Thecla pruni*.—Mr. Bellamy, two specimens of *Phryxus livornica* taken in June at Ringwood; an example of *Hesperia malvæ* var. *taras* from Holmsley; and a partially radiated form of *Abraxas grossulariata*.—Mr. Tonge, the ova of *Aporia cratægi*, in situ on a leaf of hawthorn, sent from Hyères by Mr. Powell.—Mr. Penn-Gaskill, living specimens of *Harpipteryx xylostella* and *H. nemorella*, with the elongated cocoons of the species. The larvæ were found on honeysuckle at Wimbledon.—Mr. West (Greenwich), a series of the rare Hemipteron, *Pœcilocytus vulneratus*, from Yarmouth.—Mr. Main, the egg-case and young of *Phyllodromia germanica*. He said that the young emerged almost as soon as the egg-case was deposited.—Mr. R. Adkin, examples of *Notodonta chaonia* and *Lophopteryx carmelita*, which emerged in April, 1906, from 1904 pupæ.—Hy. J. Turner (*Hon. Rep. Secretary*).

City of London Entomological and Natural History Society.—*May 1st.*—Rev. C. R. N. Burrows exhibited preserved larvæ, including *Acidalia degeneraria*, *Sesia chrysidiformis*, and *Melitæa artemis*.—Mr. J. A. Clark, *Mesophleps silacellus* taken at Falmer, July, 1905.—Mr. W. J. Kaye, *Orgyia gonostigma*, including first brood reared July, 1905, from wild Essex larvæ, and a second brood bred in September

and October of same year, from ova laid by the first brood.—Mr. V. E. Shaw, *Hybernia progemmaria* var. *fuscata*, and melanic *Phigalia pilosaria*, both from Saltaire.—Rev. C. R. N. Burrows reported that he had bred *Lycæna argiolus*, in the spring of the current year, from larvæ taken during the spring of 1905.

May 15th.—Rev. C. R. N. Burrows exhibited preserved larva of *Leucania favicolor*.—Mr. W. J. Kaye, *Eupithecia helveticaria* var. *arceuthata* from Surrey.

June 4th.—Dr. T. A. Chapman exhibited larvæ of *Euvanessa antiopa* in last stadium, from South France.—Mr. E. Harris, a series of *Hemerophila abruptaria* darker than the usual London form, bred from light parents, the offspring of a cross between light and dark forms.—Mr. C. P. Pickett, a cocoon of *Plusia moneta* about twice the normal length and open at both ends; also *Fidonia atomaria* with two extra rudimentary wings. Mr. Pickett reported that he had obtained fifty ova from a pairing of *Smerinthus populi* and *S. ocellatus*, and five ova from a cross between *S. ocellatus* and *S. tiliæ*.

June 18th.—Mr. A. J. Willsdon was elected a member.—Mr. A. Bacot exhibited larvæ of *Pyrameis cardui* reared on burdock, which apparently bore out a suggestion made by Dr. Chapman that the larva of this species is more densely covered with hair in the last stadium if fed on this pabulum as compared with thistle-fed larvæ.—Mr. A. W. Mera, *Sesia culiciformis* from Essex, with the band round the body white instead of red; also *Tæniocampa opima* from the Brentwood district, where the collecting-ground was blackened by fire some years ago. The specimens were of much lighter coloration than those taken shortly after the fire, suggesting response to environment by some more rapid means than selection.—Mr. C. P. Pickett, a rust-red specimen of *Smerinthus tiliæ*, *S. populi* with a lilac-tinted bloom on the wings, and *Procris geryon* from Chiltern Hills.—S. J. Bell, *Hon. Sec.*

OBITUARY.

Baron Charles Robert v. d. Osten Sacken.—In the death of Baron C. R. Osten Sacken, which took place at Heidelberg on May 20th last, it may truly be said that Dipterology—or, in fact, Entomology—has lost one of its brightest ornaments. For many years his general knowledge of the Diptera exceeded that of any other student of the Order. In many ways he constituted the *beau idéal* of a scientific entomologist; absolute master of numerous languages, independence of means, social rank, retentive memory, accurate observation, possessor of an almost perfect library of works upon Dipterology, and polished manners—these qualities all combined enabled him to hold the highest rank in his special branch of science. The last work he published was his autobiography, issued when he was seventy-five years old, and since then (three years ago) nothing has appeared from his pen. In a short notice it is impossible to do justice to his work, but it is duly appreciated by all those who have had opportunities to profit from it.

G. H. V.

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LIFE-HISTORY OF *PIERIS DAPLIDICE*.

BY F. W. FROHAWK, F.E.S., M.B.O.U.

ON October 3rd, 1901, I received, from Hyères, four *Pieris daplidice* females, but only one reached me alive, and in a very feeble condition; therefore, I immediately fed it with sugar and water. After drinking for about fifteen minutes it considerably revived. I then placed it on some mignonette (*Reseda odorata*) in the sun, when she at once commenced depositing, and in a short space of time (about half an hour) about three dozen eggs were deposited on various parts of the plant, but most were on the under side of the leaves. Those laid upon the bloom exactly resemble the anthers in size and colour. They are laid singly, and stand erect.

Again, on October 8th, Mr. F. Raine kindly sent me three more females from Hyères. These deposited a few eggs on the morning they arrived (October 10th), and continued depositing daily when the sun shone sufficiently.

The egg is $\frac{1}{30}$ in. high, of an elongated conical shape, widest at the middle, and slightly concaved directly below the apex; the extreme summit is flat and finely pitted in the centre; there are thirteen or fourteen (usually thirteen) longitudinal keels, all running the entire length, and about thirty transverse ribs; both these and the keels are of glistening whiteness. When first laid the colour is a light yellowish green; it gradually turns yellower, and on the third day assumes an orange colour, and finally, on the fourth day, attains a deep orange (not one out of the large number of eggs I obtained was of the colour described by Buckler, and quoted by recent authors, as being "bright pinkish red colour," nor is the newly-hatched larva red, as stated by Tutt, 'British Butterflies,' p. 241). The egg is wonderfully similar to that of *Euchloë cardamines*, but has not the transparent elongated apex, and all the keels in *daplidice* run to the summit, whereas in *cardamines* some vanish before reaching it.

Just before hatching the colouring becomes much duller, and the little larva shows clearly through the glistening shell.

All the three dozen eggs laid October 3rd hatched on October 13th, remaining ten days in the egg state.

The larva directly after emergence is very small, measuring only $\frac{1}{24}$ in. long; it is uniformly cylindrical, and very much like *cardamines*. The head is shining black, and beset with a number of fine bristles. The body is of a rich raw-sienna colour, the segments are bilobed transversely; on the side of each segment are five large olive-brown blunt tubercles with pale centres, each bearing a long, stiff, black, clefted, knobbed spine. These are situated over the body similar to *cardamines*; others are also placed on the claspers. The spiracles are black. The dorsal surface is smooth, but granulations gradually develop on the sides, and the ventral surface is strongly granulated, where they form small points.

Just previous to the first moult it measures $\frac{1}{9}$ in. long. Several moulted first time on October 18th, the first stage occupying five days.

After first moult (ten days old) it measures $\frac{1}{5}$ in. long. The ground colour is a pale lilac-grey, mottled with dark olive; a pale medio-dorsal line formed by the mottlings not uniting in the centre; there are four longitudinal lemon-yellow stripes, two on either side, one being subdorsal, and which is the broadest and brightest, and the other spiracular. On the side of each segment are nine large shining olive-black tubercles, six above and three below the spiracle, and five small ones placed between the two subdorsal stripes. As in the previous stage, each tubercle emits a black bristle with a clefted knob, which carries a minute globule of clear white liquid. The head and spiracles are similar to first stage, the legs are black, and the claspers tinged with lemon-yellow. They rest in a straight attitude. I could not detect any traces of cannibalism in these larvæ, in this respect differing greatly from *cardamines*.

Several moulted the second time October 23rd, the second stage also lasting five days. A large number died just before and after second moult, owing to the dull and cold weather. When thirteen days old, after second moult, it measures $\frac{7}{16}$ in. It is uniformly cylindrical. Excepting the head, which is ochreous blotched with black, and the brighter colouring and better defined pattern due to its increased size, it is similar in all respects to the previous stage.

The third moult occurred on the evening of October 27th, the third stage occupying only four days. After third moult (nineteen days old) it is $\frac{5}{8}$ in. long. All the colours are brightly and clearly defined; the stripes are rich gamboge-yellow; the medio-dorsal line is slightly paler than the broad dorsal slate-blue band, which is chiefly formed by a border of dark mottlings along either

side. The larger wart-like tubercles are very conspicuous, black and shining. All the spines (bristles) are in this stage simple and finely pointed, and many of the smaller ones are whitish. The longest are slightly curved, and have the apical half white. The head is coloured like the body, the yellow spiracular stripe extending over the face.

A few succeeded in moulting the fourth time during the last days of October, and one moulted on November 3rd, but on that day a dense fog set in, and lasted until the evening of the 8th. This, accompanied by frost at night, proved fatal to all the larvæ. They were in various stages, many were quite small.

After fourth and last moult (fully grown) it measures 1 in. in length. The body is cylindrical, tapering at the ends; the segments are subdivided by six transverse wrinkles, which number only two in the first stage. The ground colour is a clear lilac; a very fine and faint medio-dorsal line, and four rich yellow longitudinal bands, two on each side; the first is subdorsal and widest, broken up on the fourth wrinkle with pale grey; the second band is spiracular, and extends over the side of the head; it is also broken up into a series of markings by the central third portion on each segment being of a pale greenish grey, which encloses the very pale inconspicuous spiracle. At the base of each clasper and leg is an ochreous-yellow blotch, forming a disjointed third band. The whole surface is densely sprinkled with black shining warts, varying greatly in size, each bearing a fine simple spine, the majority being shining black; those on the ventral surface are whitish, the head of similar colouring as the body, and likewise covered with warts and spines. The legs are mottled black and whitish; the lilac ground colour of the body is mottled with dusky spots, on which are placed the smallest black warts. Excepting the first stage, the larva is similar in pattern throughout.

The above description of the full-grown larva is from a specimen found by Mr. Raine at Hyères feeding on wild mignonette (*Reseda lutea*), who very kindly sent it direct to me. It arrived on November 16th, and, after feeding on that and the following day, it spun up for pupation on the 18th, and pupated on the 20th November.

Mr. Raine also found a pupa at the same time, which he also sent me, and from which the following description is made:—The pupa measures $\frac{3}{4}$ in. long. In shape it exactly resembles *P. napi*, having a pointed beak, a strongly angulated thoracic dorsal keel, subdorsal abdominal angular projections, and a basal wing-point. The colour is a very pale lilac-grey, with creamy buff subdorsal and spiracular stripes corresponding with those of the larva; a medio-dorsal whitish line dotted with black at the segmental divisions along the abdomen. The entire surface is sprinkled with minute black dots, black markings on the keel,

and a black streak on either side of the beak. The wings are buffish, with black speckled nervures. Like other Pieridæ pupæ, it is attached by the cremastral hooks to a layer of silk, and a silken girdle round the waist.

A female imago emerged on December 11th, 1901.

The English climate of late autumn and winter is obviously quite unsuitable for the existence of *P. daplidice*, as well as both species of *Colias* and *Argynnis lathonia*. I have always found that the first spell of cold and damp weather (especially fog and frost) to be fatal to them; when in the larval state they immediately cease feeding and rapidly die, and unless protected against such climatic conditions the pupæ likewise perish, which is the cause of these species being unable to become established in Britain.

A NEW GENUS OF CRYPTINÆ (ICHNEUMONIDÆ) FROM SUMATRA.

By P. Cameron.

Phædraspis, gen. nov.

Scutellum roundly convex, strongly keeled laterally on the basal half. Metanotum with two complete keels, the apical laterally projecting into broad teeth. Spiracles about three times longer than wide. Antennæ stout, not much thickened towards the apex, ringed with white; the third and fourth joints almost equal in length. Sides and apex of clypeus depressed, margined; the apex transverse, broad. Abdominal petiole stout, the post-petiole large, broad. Radial cellule short; transverse median nervure received behind the transverse basal; disco-cubital unbroken; areolet large, five-angled, receiving the recurrent nervure near the apex; the transverse median nervure in hind wings broken at the middle. Apical segments of abdomen spotted with white. Temples appearing short from being very obliquely narrowed. Malar space as long as the antennal scape. Tarsi spinose, the fourth joint deeply incised. Metapleural keel complete. Mesonotum, scutellum, apex of first, and the whole of the second segment, and the legs, red.

Characteristic of this genus are the raised scutellum, strongly spined laterally at the base, the metanotum with two transverse complete keels, with the second broadly toothed laterally, and the transverse median nervure in hind wings broken in the middle. The legs longish, somewhat slender, entirely red. Metanotum punctured at the base, the rest closely strongly reticulated. The genus, in the arrangement of Schmiedeknecht (Opus. Ichn. 414), would come in near *Lobocryptus*, Schm., from the form of the scutellum.

Phædraspis rufobalteata, sp. nov.

Black; the mesonotum, with scutellum, the upper edge of the pleuræ narrowly, apical half of post-petiole, the second abdominal segment entirely, and the legs, red; the apical two segments white above; antennæ with the five middle joints white, except below: wings hyaline, the nervures and stigma black. ♀. Length, 12 mm.; terebra, 4 mm.

Bindji, Deli, Sumatra; January (Dr. L. Martin).

Face and clypeus closely, strongly punctured; the labrum and mandibles red, the latter black at the apex. Middle of front somewhat strongly, transversely striated; the sides and vertex almost smooth. Pro- and mesothorax closely, strongly punctured, the mesonotum thickly covered with fulvous pubescence; the scutellum is more strongly but not so closely punctured as the mesonotum. Post-scutellum smooth. Pleuræ coarsely, closely punctured, more or less striated, and becoming coarser towards the apex. Petiole smooth, the post-petiole strongly but not closely punctured; the sides of the raised central part of the post-petiole smooth and shining at the base; the second and third segments closely punctured; there is a white narrow line in the middle of the sixth segment; the apical entirely white above; the second and third ventral segments are red.

LARVÆ OF *LYCÆNA CORYDON* AND THEIR ASSOCIATION WITH ANTS.

By A. L. Rayward.

When at Reigate on June 18th last, I was fortunate enough to find on the *Hippocrepis comosa*, which is abundant on some of the hillsides there, a number of almost full-grown larvæ of *L. corydon*.

Of some thirty or more larvæ thus obtained, most, and in fact nearly all, had ants—all of the same species, *Formica flava*—upon them; and in one instance where the *comosa* was growing on the crown of an ants' nest, two larvæ found resting on two adjacent leaves of the food-plant were literally covered with the ants, more than twenty being counted on one of them.

Subsequent examination with a lens at home disclosed the fact that the transverse gland, or sac, present on the dorsal area of the seventh abdominal segment of the larva of *L. arion*—as reported by Mr. F. W. Frohawk (Ent. xxxvi. p. 59), and known to exist in other species of Lycænidæ, was well developed in these larvæ of *corydon*, and the following interesting demonstration of its function was obtained.

An ant was placed in proximity to one of the larvæ which was being examined under a microscope, and it at once began to run to and fro about the body of the larva, waving its

antennæ excitedly. In a few moments it found its way to the gland on the seventh abdominal segment, and stroked it with a rapid movement of the antennæ and first pair of legs. This action was repeated several times, when suddenly the gland was distended, and one or two—and occasionally, during subsequent experiments, three—tiny beads of a crystal-clear fluid were slowly expelled, and were greedily sucked up by the ant.

Several larvæ and a number of ants were experimented with in this way, and there was usually little difficulty in obtaining a successful demonstration, although it was observed that some ants found their way to the gland much more quickly than others, possibly because of their having had previous experience of the function of this organ.

I also observed that at intervals, while the ants were running over the body of the larva, two prominent tubercles, situated near the lateral ridge on the eighth abdominal segment, one on either side, behind and lower than the ninth spiracle, were quickly evaginated and withdrawn, sometimes singly, but frequently both together. Though these tubercles are supposed to be—and very probably are—scent-organs to attract the ant *to* the gland, it was noticed during these experiments that they were most active when the larva appeared to resent the attempts of the ant to obtain fluid from the gland, as was sometimes the case. At this time the gland was contracted and withdrawn below the surrounding surface of the segment, and the rapid erection and withdrawal of the tubercles generally resulted in momentarily distracting the ant's attention, causing it to leave the gland, to which, however, it usually quickly returned.

Wallington, August 4th, 1906.

CURRENT NOTES: 1905–6.

By G. W. Kirkaldy.

These notes are intended to present some account, necessarily imperfect, of current literature, particularly in groups and faunas of special interest to the British entomologist. There are many papers published, *e.g.*, in America, of great value to British workers, although dealing exclusively with American forms. Such are those by Nathan Banks, Bueno, Daecke, MacGillivray, Needham, and Williamson, noticed in the present instalment. It is taken for granted that readers of the 'Entomologist' are familiar with the periodicals of their own country.

1. Banks, Nathan: "A Revision of the Nearctic Hemerobiidæ" (Trans. American Ent. Soc. xxxii. 21–52, pl. iii–v. (Feb., 1906) [Neuroptera]).
2. Bueno, J. R. de la T.: "Ways of Progression in Waterbugs" (Entom. News, xvii. 1–4 (Jan., 1906) [Hemiptera]).
3. Daecke, E.: "On the Eye-coloration of the Genus Chrysops" (*l. c.* 39–42, pl. i. (Feb., 1906) [Diptera]).
4. Del Guercio, G.: "Contribuzione alla Conoscenza delle forme e della Biologia del *Paracletus cimiciformis*, Heyden" (Redia ii. 90–8, pl. viii. (1905) [Hemiptera]).
5. *Id.*: "Contribuzione alla Conoscenza delle *Sipha*, Pass.," &c. (*l. c.* 127–53, pl. xiii–xiv. (1905) [Hemiptera]).
6. *Id.*: "Contribuzione alla Conoscenza delle metamorfosi della *Sciara analis*, Egg., con notizie intorno alla *Sc. analis*, Bezzii v. n. ed. ai loro rapporti con alcuni Sporozoari ed Entomozoari parassiti" (*l. c.* 280–305, text-figs. 1–21 (1905) [Diptera]).
7. *Id.*: "Sulle differenze esistenti fra la *Schizoneura reaumuri*, Kalt. ed il *Pachypappa vesicalis*, Koch," &c. (*l. c.* 306–15, text-figs. 1–9 (1905) [Hemiptera]).
8. Felt, E. P., and others: "20th Report of the State Entomologist on Injurious and other Insects" (Bull. New York State Mus. 97 (Ent. 24), 359–597, pls. 1–19, text-figs. 1–24 (Nov., 1905)).
9. Hine, J. S.: "A Preliminary Report on the Horse-flies of Louisiana, with a Discussion of Remedies and Natural Enemies" (Circ. State Crop Pest Comm. Louisiana, 6, pp. 1–43, text-figs. 1–20 (1906)).
10. Koorders, S. H., and Zehntner, L.: "Over eenige Ziekten en Plagen van *Ficus elastica*, Roxb." (De Cultuurgids, vii. 439–72, pls. i–iv. (1905)). [Reprinted as Bull. Algemeen proefst. Salatiga, 3, pp. 1–34, pls. i–iv. (1905)].
11. MacGillivray, A. D.: "A Study of the Wings of the Tenthredinoidea, a superfamily of Hymenoptera" (Proc. U. S. Nat. Mus. xxix. 569–654, pls. xxi–xliv. (No. 1438) (1906)).
12. Marlatt, C. L.: "The Annual Loss occasioned by Destructive Insects in the United States" (Yearb. U. S. Dep. Agr. 1904, 461–74 (1905)).
13. Needham, J. G.; Morton, K. J.; and Johannsen, O. A.: "Mayflies and Midges of New York" (Bull. New York State Mus. 86 (Ent. 23), 1–352, pls. 1–37, text-figs. 1–18 (June, 1905)).
14. Pictet, A.: L'influence de l'alimentation sur la détermination du sexe chez les Lépidoptères" (Arch. Sci. Phys. Nat. 4, xix. 102–5 (1905)).
15. Schneider, J. S.: "Sydherö. Et lidet bidrag til kundskaben om den arktiske skjærgaards malakologiske og entomologiske fauna" (Tromsö Mus. Aarsheft. xxvii. 170–205 (1906)).

16. SCHROEDER, C.: "Eine Kritik der Erklärungsversuche der lebhaften Hinterflügelfärbung in genus *Catocala*, Schr." (Biol. Cent. xxv. 51–63 (1905) [Lepidoptera]).
17. SLINGERLAND, M. V.: "Formaldehyde as an Insecticide" (Ent. News, xvii. 130–3 (Apr., 1906).
18. STEVENSON, E. C.: "The External Parasites of Hogs" (Bull. U. S. Bur. Animal Ind. 69, pp. 1–44, figs. 1–29 (1905) [Pediculidæ and Acarina]).
19. VOSSELER [J.]: "Die Wanderheuschrecken in Usambara im Jahre 1903–1904," &c. (Ber. Land-und Forstwirtsch. in Deutsch-Ostafrika, ii. 291–374, pls. xii. and xiii. (col), text-figs. 1–2 (Oct., 1905) [Orthoptera]).
20. WILLIAMSON, E. B. and CALVERT, P. P.: "Copulation of Odonata" (Ent. News, xvii. 143–50, pl. vii. (May, 1906) [Neuroptera]).
21. Editorial in Entom. News. xvii. 180 (May, 1906).
22. BERGROTH, E.: "Stridulating Hemiptera of the subfamily Halyinæ, with Descriptions of New Genera and New Species" (P. Zool. S. London, 146–54 (Oct. 17th, 1905) [Hemiptera]).
23. BANKS, C. S.: "The Principal Insects attacking the Coconut Palm (Part I.)" (Philippine Journ. Sci. i. 143–67, pls. i.–xi. (Feb., 1906) [Coleoptera]).
24. BALLOU, H. A., and others: "Notes on West Indian Insects" (West Indian Bull. vii, 40–63).
25. BALLOU: "Cotton Stainers" (*l. c.* 64–85, one map [Hemiptera]).
26. LAMEERE, A.: "Notes pour la Classification des Diptères" (Mém. Soc. Ent. Belgique xii. 105–40).
27. PLATEAU, F.: "Le Macroglosse (observations et expériences)" (*op. c.* 141–80, text-figs. 1–6 [Lepidoptera]).
28. SCHOUTEDEN, H.: "Catalogue des Aphides de Belgique" (*op. c.* 189–246 [Hemiptera]).
29. GIRAULT, A. A.: "The Bed-bug," &c. (Psyche, xii. 61–74 (Aug. (?), 1905), and xiii. 42–58 (June (?), 1906) [Hemiptera]).
30. MITCHELL, E. G.: "Mouth Parts of Mosquito Larvæ as indicative of Habits" (*op. c.* 11–21, text-figs. 1–3 [Diptera]).
31. WASHBURN, F. L.: "The Diptera of Minnesota" (Bull. Minn. Agr. Sta. 93, pp. 19–168, pls. i.–ii. (col.), text-figs. 4–163 (dated Dec., 1905, published 1906)).
32. KIEFFER, J. J.: "Diptera Fam. Chironomidæ" (Gen. Insect fasc. 42, pp. 1–78, pls. 1–4).

Nathan Banks's revision (1) of the Nearctic Hemerobiidæ will be very useful to the British neuropterist, as it is thirty-six years since the British forms were discussed by McLachlan, and the European forms have never been adequately reviewed.

Vosseler (19) discusses at length certain migratory locusts in German East Africa, with detailed biological notices.

Koorders and Zehntner (10) give an account of the diseases and pests of caoutchouk in Java. Among the insects figured in one or more stages are *Oleandrus graniger* and *Gryllacris* sp. (Orthoptera), and *Glyphodes vivitralis* (Lepidoptera). C. S. Banks (23) writes on the pests of the coconut-tree in the Philippines. *Oryctes rhinoceros*, *Rhynchophorus ferrugineus*, *Cyrtotrachelus* sp., &c. (Coleoptera), are discussed and figured.

Felt's report (8) deals principally with studies in Culicidæ by Dr. Felt, and a comprehensive list of the "Jassidæ" of the State, by H. Osborn. Needham's report (13) is the third of the valuable series of studies on the aquatic insects of New York State, directed by Dr. Felt. It treats, in the same comprehensive manner as the previous publications, of Ephemeridæ, Hydroptilidæ, Nematocerous Diptera, &c.

Pictet (14) discusses the influence of food on the development of sex in Lepidoptera, while Schroeder (16) writes on the interpretation of the bright colouring of the hind wings in *Catocala*.

Del Guercio (4–7) contributes four valuable biological studies on Diptera and Hemiptera. Bueno (2) reviews the methods of progression, both on land and in water, of various genera of American waterbugs. Bergroth (22) discusses stridulating Hemiptera of the family Cimicidæ, subfamily Halyinæ, and describes the organs in certain Cimicids. Williamson and Calvert (20) query "the accepted statement that in pairing the male dragonfly grasps the female by the prothorax," and show that in certain forms the female is grasped by the head.

Daecke's paper (3) is interesting, but as the colour fades when the fly is dried, and the variation is apparently overlapping to a large extent in different species, the value of the design for purposes of specific determination is not yet strongly evident. MacGillivray (11), after briefly noticing the origin of the hymenopterous type of wing, proceeds with a detailed study of the wing areas, of the dynamical control of wing-type, of the phylogeny of the sawflies, and concludes with tables for separating the families and subfamilies according to the structure of the organs of flight. Steven's bulletin (18) contains articles on *Hæmatopinus suis*, the hog-louse, and *Sarcoptes scabiei* var. *suis*, and *Demodex folliculorum* var. *suis*, two species of mange-mites.

Marlatt (12) estimates conservatively the annual loss from pests in the United States at over seven hundred million dollars (say one hundred and forty million sterling). Slingerland (17) finds that formaldehyde "has little or no insecticidal qualities, when used in practicable quantities, and especially against household insects."

The 'Entomological News' (21) contains a remarkable quotation from a recent American paper (the 'Medical Brief,' p. 282,

April, 1906) of the seriousness of which there can be, it is said, no question :—"Take the human seed-germs (spermatozoa), put them upon a plate, first spreading some alkaline nourishment upon the plate—for instance, a little soap; place the plate in a room of proper temperature, and in sixteen to twenty-four hours swarms of *ants* will be running about. In other words, these living human germs, placed under this different condition other than the mother-soil, develop into ants. These little fellows can be watched and be seen to gradually develop and start off on the run. This would evidently appear that living germs, when placed by accident, or otherwise, under very different conditions, produce very different forms of life. But what relationship do we owe to the ant? Perhaps this is why the claim is made that the ant has more characteristics of the human being than any other animal." As the 'News' says, this is carrying us back before the time of Redi, who lived about 1618.

The "Notes on West Indian Insects" (24) comprise (1) a reprint of a paper by A. H. Clark in 'Psyche' (1904) on the Insects of Barbados and other islands, annotated by G. T. Carter; (2) a reprint of Notes on Orthoptera, by J. A. G. Rehn (in 'Entomological News,' 1905); and (3) original notes on a few insects of general interest, by H. A. Ballou. This is followed by an extensive systematic and economic article on "Cotton-stainers" (*Astemma* or *Dysdercus*), bugs of the family Pyrrhocoridæ, a genus which damages cotton almost all over the world.

In the 'Entomologist' for 1900 (vol. xxxiii. pp. 361–3), I reviewed, very briefly, Prof. Lameere's "Notes pour la Classification des Coléoptères." In the 12th Memoir of the Entomological Society of Belgium * Lameere has expounded his views on the classification of the Diptera (26). The division of this order into Orthorrhapha and Cyclorrhapha is rejected, and the following two suborders accepted, *viz.* :—

(1.) *Nemocera*, with the eyes (originally) remote and similar in the two sexes;

(2.) *Brachycera*, with the eyes contiguous, at least in the male, or kainogenetic † and dimorphic.

In the first the antennæ are long and dimorphic, and the maxillary palpi well developed; in the second the antennæ are shortened and similar in the two sexes, the maxillary palpi are reduced, but these characters are not absolute as is that furnished by the eyes.

According to Lameere, the *Nemocera vera* form one group, the other being formed of the *Brachycera* and the *Nemocera*

* To celebrate the Jubilee of the foundation of the Society.

† Or cenogenetic, *i. e.*, "relating to modified evolution, in which the non-primitive characters make their appearance in consequence of a secondary adaptation of the embryo to the peculiar conditions of its environment."

anomala, so that the gist of his classification is (1) that the *Nemocera anomala* of Osten Sacken (Bibionidæ, &c.) are removed from the vicinity of the *Nemocera vera* and placed near the Stratiomyidæ with the *Brachycera*, and (2) the merging of Œstridæ, Nycteribiidæ, Hippoboscidæ, &c., in Muscidæ.

Mitchell (30) deals with the mouth parts of mosquito larvæ as indicative of habits, dividing them into two categories; (1) insectivorous, normally preying on small aquatic larvæ, and (2) non-insectivorous, feeding on vegetable matter, protozoa, &c. Somewhat intermediate are the *Urano-tænia* and *Anopheles* groups. "That the differences in habits are correlated with marked differences in the structure of the mouth parts" is demonstrated by figures and comparative tables. Washburn (31) has continued the well-known Minnesota *résumés* of our knowledge in various orders of American insects, by a useful summary of the Diptera. The late Otto Lugger dealt with the Orthoptera, Lepidoptera, Coleoptera, and Hemiptera. These well-illustrated bulletins are actually reports on the economic insects of Minnesota, but they are useful for all workers. The structure of the Diptera is first discussed (pp. 22–32, figs. 4–15), the various families being then considered in turn.

The Chironomidæ have been revised generically by Kieffer (32), the known species being listed. Four excellent plates elucidate the text, in which fifty-four genera are admitted. By an oversight, *Tanytarsus lacteiclavus*, Grimsh., and *Chironomus hawaiiensis*, Grimsh., both from the Hawaiian Islands, have been omitted, and a preoccupied generic name (*Ceratolophus*) has been used.

Of special interest to British workers will be Schouteden's "Catalogue of the Belgian Aphidæ" (28), a critical list running to fifty-eight pages. Girault (29) has discussed the bed-bug (*Clinocoris lectularius*) at some length, with especial regard to its food supply, metamorphoses, and pathogenic relations.

Plateau (27) has contributed some extensive observations and experiments on *Macroglossa stellatarum*. He refrains from formulating any conclusions, owing to the incompleteness of his experiments—lengthy and laborious though these were—as his fields of observation were destroyed by the creation of a new railway station, and the *Macroglossa* thus rendered very rare. After discussing certain details of the habits of the moth, the learned Belgian treats of (1) the attraction of *Macroglossa* and other insects by coloured cloth and coloured paper; (2) its flight in front of flowers painted on these substances; and (3) *Macroglossa* and artificial flowers. These are followed by a note on *Macroglossa* and the bracts of *Salvia horminum* (a sage not, I think, found in Britain).

ON SOME BRACONIDÆ FROM THE HIMALAYA.

By P. Cameron.

I am indebted to Col. C. T. Bingham for the under-noted species:—

Xiphozele, gen. nov.

First abscissa of cubitus long, angled below the middle, its basal abscissa obliquely sloped to below the middle, where it receives the recurrent nervure, the apex obliquely sloped upwards; the first cubital cellule is very large, much longer along the costa than it is wide at the base; the second cellule long, especially along the cubitus; transverse median nervure interstitial, much thinner than the others, angled outwardly above the middle. First abscissa of radius long, as long as the first transverse cubital nervure, about one-fourth shorter than the second; it is thicker than the second, the latter thicker than the third, which is roundly curved forwards at the base. Stigma long, lanceolate; the radius issues from behind its middle, but not much. Anal nervure not interstitial. Radial cellule in hind wings divided at the apical third; from the præbrachial a longish nervure runs obliquely downwards from beyond its middle to the probrachial, which it does not quite reach. Clypeus roundly convex, clearly separated behind; its apex transverse, clearly separated, obliquely projecting. Eyes large; malar space small, but distinct. Ocelli large, the anterior smaller than the others. Temples distinct, rounded, oblique. Mesonotum trilobate. Abdomen strongly compressed, beyond the middle as in *Ophion*; the first segment cylindrical, narrowed at the base to the spiracles, which are prominent, and placed shortly but distinctly behind the middle. Legs long, slender; the spurs more than half the length of the metatarsus; claws broadly dilated at the base, narrowed and curved at the apex; hind coxæ long.

An easily recognized genus from the very large first cubital cellule, caused by the obliquely sloped basal abscissa of the cubitus, and by its being so distinctly angled shortly beyond the middle. As a consequence of this slope, the prædiscoidal cellule is narrowed at the apex, it being there half the width it is at the base. Characteristic, too, is the narrowed, angled, transverse median nervure, which does not reach the præbrachial, but is united to a short thickened nervure, which is more developed beyond than behind it; a similar but shorter thickened nervure or cloud runs into the anal nervure. Palpi long, pilose. Metanotum transversely striated, without any longitudinal keels; the pleuræ project beyond it; spiracles linear. Occiput margined.

This genus belongs to the Zelini, and from its divided radial cellule comes near to *Homolobus*, Foerster; from *Zele*, as well as from the other genera, it should be easily known by the large first cubital cellule, the angled basal abscissa of radius, the peculiar transverse median nervure, narrowed at apex of first dis-

coidal cellule, by the transverse præbrachial nervure sloping towards the apex, not towards the base of the wing, and by the compressed abdomen.

Xiphozele compressiventris, sp. nov.

Testaceous; the fifth and following segments of the abdomen black; the legs paler, especially the hind tarsi; wings clear hyaline, the parastigma and stigma testaceous, the costa and nervures black. ♀. Length, 21 mm.

Sikkim.

Mesopleuræ closely, distinctly punctured, more or less reticulated in the middle, almost smooth at the apex above. Metanotum strongly, but not closely, transversely striated; the metapleuræ at the apex widely irregularly reticulated. Abdomen about three times longer than the thorax.

From the coloration of this species, and from its large eyes and ocelli, I should think that it is of nocturnal habits like *Ophion* and *Paniscus*, to which it has a great resemblance.

Batotheca leucomelæna, West.

Spinaria leucomelæna, Westwood, Tijd. voor Ent. 1882, 31, tab. 7, f. 2.

Sikkim.

Described from Cambodia, Siam.

Spinaria flavipennis, sp. nov.

Luteous; the flagellum of antennæ black, the sides of the basal three abdominal segments, the ventral surface, and the apical segment white; wings luteous-hyaline, a triangular, oblique cloud at the base of the stigma and a broad one round the apex, except in the radial cellule; the costa, stigma, and nervures bright luteous. ♀. Length, 12 mm.

Sikkim.

Abdomen strongly, closely, longitudinally striated throughout, the striæ becoming weaker towards the apex; the apex of the third segment with a blunt, short triangular tooth in the middle, its sides and the sides of the fourth with a longish spine, broad at the base, becoming gradually narrowed towards the apex; the fourth stoutly keeled down the middle, the keel stronger at the apex, projecting and running down the apical slope of the segment; its base behind the furrow is smooth, impunctate; the furrow before this smooth part is closely crenulated; the last segment becomes gradually roundly curved to a sharp point, or longish tooth. The basal three abdominal segments are as long as the head and thorax united. Metanotum keeled down the middle, the base bordered by a curved irregular keel, forming a large basal areæ; the rest irregularly reticulated, the basal reticulations more irregular and larger than the apical; there is a stout, irregular, curved keel outside and inside the spiracles. Propleuræ with two curved keels, united below and with a longish keel behind them, in the centre. Mesopleural furrow wide, shallow, irregularly

striated. Pronotal spine long, sharp-pointed, roundly curved towards the head. The spines on the sides of metanotum stout, oblique, short, rounded and narrowed at the apex.

Spinaria bhotanensis, sp. nov.

Length, 12 mm. ♀.

Buxa, Bhotan (Dudgeon).

The resemblance of this species to *S. flavipennis* in form and coloration is very great; the two may be separated thus:—

The radial, the second and third cubital cellules, and the lower part from the recurrent nervure smoky, the basal cloud reaching to the apex of the basal abscissa of cubitus; the depressed lower part of mesopleuræ wide at the base, gradually narrowed towards the apex, closely reticulated-striated . . . . . *bhotanensis.*

The radial, second cubital and base of third, and the base of discoidal cellules unclouded; the depressed lower part of mesopleuræ not much narrowed at the apex, irregularly striated and punctured . . . . *flavipennis.*

The hind wings are clouded from near the middle; the cloud in the first cubital cellule is along the cubitus, extends to the apical fourth, becomes gradually narrowed to a fine point, and extends slightly into the discoidal cellule. The pronotal spine is long, curved; the top of the part in front of it is depressed, narrowed obliquely towards the spine, the base rounded laterally, the middle with a slight incision. Centre and base of metanotum irregularly, widely reticulated; the central keel larger than the others; the apex with three areæ, of which the central is not so wide, and has a keel down its middle; the lateral spines stout, oblique, wide at the base, narrowed and rounded at the apex. All the abdominal segments are stoutly, closely, longitudinally striated; the ventral surface, the sides of the basal two, and the apical segments are white; the latter is narrowed gradually to a long spine. Before the middle of the propleuræ are two stout, roundly curved keels, close to each other, and with a short oblique one in front. The keels bordering the scutellums are stout. Last joint of hind tarsi black, as in *flavipennis.*

If it were not for the marked difference in the clouding of the wings, I should have felt inclined to regard this species as a form of *flavipennis.*

NOTES AND OBSERVATIONS.

Notes on the Occurrence of Pyrameis cardui in the Early Summer of 1906.—With reference to Mr. Adkin's interesting article on the abundance of *Pyrameis cardui* in June of this year (*ante*, p. 173), I think perhaps some observations I made on the occurrence of this insect in the early part of the summer, or perhaps, to be more correct, in the late spring, may be of further interest to your readers. All during May I paid frequent visits to the coast between Eastbourne and

Birling Gap, but I saw nothing of this insect until almost the end of May, and then only two or three solitary specimens. On the day (June 3rd) that Mr. Adkin saw them in such numbers on the slopes of these cliffs, I was at Abbott's Wood, near Polegate, some five miles inland, and was surprised to see scores of *P. cardui* hovering over the flowers in a neighbouring field, most of them in perfect condition. I captured a number of them, and found in most cases that their fringes were intact and their colours almost as fresh as in the autumnal specimens. They certainly did not appear to have been very long on the wing. This, however, does not preclude the supposition that they are immigrants, as I am convinced that a passage across the sea, even on a high wind, would do less damage to their wings than a few days fluttering about amongst herbage. As some evidence of this, the greater number of those I examined on the 3rd were in good—almost perfect—condition, whereas in a few days, at the same spot, I was scarcely able to find a single specimen that was not worn or damaged in some way. By the 8th and 9th their number was considerably reduced, but as I left for Norfolk on the evening of the 9th, I was unable to continue my observations. On my return at the end of the month they had all disappeared. Particulars of the direction and velocity of the wind for the last few days in May and the beginning of June may be of interest in the matter; I therefore give them in tabular form:—

	Morning.	Afternoon.		Morning.	Afternoon.
May 28.	*W. 4.	W. 4.	June 1.	S.S.W. 4.	Calm.
,, 29.	W. 4.	W.N.W. 4.	,, 2.	W. 3.	Calm.
,, 30.	W. 2.	W. 1.	,, 3.	N.N.E. 4.	Calm.
,, 31.	W.N.W. 1.	W. 2.	,, 4.	E.N.E. 3.	E. 2.
			,, 5.	E. 2.	S.S.E. 3.

The prevailing winds during May were S.W. and W., and these continued up to the morning of the 3rd, and would be unfavourable to the crossing of any insects from the Continent; but early on the morning of the 3rd the wind changed to N.N.E., and was moderately strong, and would have been more favourable for their passage, and the continuing easterly winds for their dispersal over the country. It would be of great interest if observers in the Midlands and West of England would send in reports as to the exact dates of their having seen this insect, and whether singly or in some number.—J. E. Campbell-Taylor; Belmont, Polegate, Sussex.

Dates of Appearance of Zygæna filipendulæ and Z. trifolii.—I should like to raise a question as to the approximate date of their emergence. I find that nearly all authorities give early June, or at any rate June, as the time. Now my own experience is that they are more frequently met with in July. I saw nothing of them this year until July 1st, on which date I took both *Z. filipendulæ* and *Z. trifolii*, freshly emerged, at Polegate. On the 7th I found about thirty cocoons of the former on the slopes near Beachy Head, and these emerged

* The figures following the direction indicate the velocity on the scale of 0–10.

between the 24th and 26th. On the 8th I again took both flying in the sunshine in a meadow near Hailsham. And it has been my experience in past years that July is the month in which they mostly occur.—J. E. Campbell-Taylor; Belmont, Polegate, Sussex.

Notes on the Capture of Boletobia fuliginaria.—During the years 1904–1905, I was a student at the Royal Staff College, Camberley. Whilst doing schemes in the evening after dinner in my study I used to keep the door into the garden and the windows open, in order to give the local Lepidoptera every opportunity to come in and be caught. On the evening of July 12th, 1904, several moths came into the study and flew around the incandescent light. I caught one that I thought I wanted, and whilst getting it into the killing-bottle I noticed that there was another moth resting at the bottom of my net. It proved to be a specimen of *Boletobia fuliginaria* in good condition. About half an hour later I chanced to look at the open door leading into my garden, and there on the woodwork sat another specimen. On July 16th I found a third on a window of the Staff College itself, and on July 20th a fourth specimen came into my study. I saw it come in, having been very much on the *qui vive* every evening after my first captures. It flew with a slow, flapping flight, and, as they are so dull-coloured, was exceedingly hard to see. The same year a brother officer took a specimen at light at his house, and in 1905 I could not come across any more specimens, but this same brother officer took two, one at light, and the other at sugar. The larvæ of *B. fuliginaria* are supposed to feed on fungus growing on rotten wood. The house I lived in had some stables and outbuildings near it, which contained plenty of rotten wood, but although I searched carefully, I never succeeded in finding the larvæ. I now possess four specimens of the above-mentioned insect, three of them being very good specimens, the fourth, which I captured in the Staff College, being slightly rubbed.—B. Tulloch (Captain); Strensall, York, Aug. 4th, 1906.

Sesia andreniformis bred.—The Hon. N. Charles Rothschild records in the Ent. Mo. Mag. for July that a fine *Sesia andreniformis* emerged on June 10th last from a larva he found mining in a stem of *Viburnum lantana*.

Meteorological Conditions affecting Lepidoptera.—I have read with considerable interest the article of Messrs. J. Lissant Cox and Justin Brooke on the "Noctuæ in Huntingdonshire," &c. (*ante*, p. 127), as it contains some remarks on a subject which one does not usually meet in entomological literature—namely, about the influence of meteorological conditions on the appearance of moths. I find that the conclusions arrived at by the authors coincide entirely with my observations made some years ago (a short abstract of them was published in the 'Entomologist,' vol. xxix. pp. 101–103). Apparently the influence of meteorological conditions of the night on the frequency in occurence of moths is the same in such different places as Huntingdonshire and St. Petersburg; the insignificant number of observations at present available does not permit of further conclusions. I should like to draw the attention of entomologists to this subject, as systematic observations on the influence on meteorological and other

conditions on the habits of moths, carried out in different localities, are sure to afford valuable hints for the biology of Lepidoptera.—B. MENSCHUTKIN; St. Petersburg-Sosnowka, Polytechnical Institute, Laboratory of Organic Chemistry, Aug. 9th, 1906.

NOTES ON PYRAMEIS CARDUI.—At Dovercourt several worn examples of this butterfly were noticed during May. On June 1st I went to Instow, North Devon, and on the 2nd of the month, which was rather cold with a fresh north-westerly breeze, and on the 3rd, which was brighter, warmer, and less windy, a few were seen flying about the gardens and elsewhere. On the 4th, a delightfully bright hot day, with a light north-westerly breeze, I went to some high moorland to look for *M. artemis*, and here there were numbers of *cardui* passing from south-east to north-west, flying at great speed, and scarcely ever alighting on flowers or on the ground. During the three hours I was there, there was a constant succession of them, and there were always two or three in sight at the same time. I must have seen many hundreds in the course of the morning, and on my way home they still kept passing, and I saw great numbers again in the afternoon, all apparently migrating in the same direction. All that passed near seemed to be bright fresh-looking insects. On the 5th and 6th, which were very bright warm days, with a gentle breeze from the south-west, I was collecting on some rough high land, some 750 ft. above the level of the sea, and situated sixteen or eighteen miles to the south-west of the ground I was on on the 4th, and here *cardui* were plentiful, but seemed to be stationary. On the 7th, another lovely day, I was working on some slopes above the River Yeo, between Barnstaple and Lynton, about twenty miles to the north-east of where I was on the 5th and 6th, and here I also found *cardui* flying in some numbers, and noticed several females busily engaged depositing their ova upon various species of thistles. The whole time I was in North Devon—from June 1st until July 19th—I do not think a day passed without seeing this butterfly, but towards the end of my visit many of them were in an extremely ragged condition. On July 14th, while looking for *P. lithodactylus* among fleabane (*Inula dysenterica*), I noticed a small larva of *cardui* sitting quite exposed on the upper surface of a leaf, and upon searching the plants I saw that a quantity of larvæ must have been feeding, to judge by the number of empty "tents." I found two or three more small ones and one nearly full grown. The young larvæ appeared to attack the flower-buds first, spinning the terminal leaves together over the bud, which they devour, and then leave and spin "tents" lower down the stem. This was the first occasion upon which I had met with larvæ of *cardui* upon fleabane, and I do not think that it has been recorded as a food-plant. I have since seen larvæ and empty tents upon several species of thistle. The larvæ I found produced butterflies on August 3rd–5th, and I have seen many fresh-looking butterflies in this neighbourhood during the past week.—GERVASE F. MATHEW; The Green, Ferndown, Dorset, August 20th, 1906.

CAPTURES AND FIELD REPORTS.

PACHETRA LEUCOPHÆA NEAR BOXHILL.—While sugaring for *Agrotis cinerea* near Boxhill in early June this year, I was agreeably surprised to take several fine specimens of *P. leucophæa*, and later I also found a few females, with batches of ova, on the grass-stems by searching with a light. One female also came to sugar. Messrs. Tonge, Grosvenor, and Hodgson of this district also took this species in the same locality, obtaining, however, only females and ova.—A. J. WIGHTMAN; Redhill, August 21st, 1906.

AN ENTOMOLOGICAL HOAX?—In the August number of this magazine, p. 188, Mr. Arthur Dods records the capture of *Limenitis sibylla*, and the finding of pupæ of *Papilio machaon* on Ranmore Common. I may say that I placed about seventy pupæ of *P. machaon* there in June, but I know nothing of the *L. sibylla*. The pupæ of *P. machaon* were of continental origin, and as this species is anything but a marsh species there, I saw no reason why it should not breed on Ranmore Common.—A. J. WIGHTMAN; Redhill, August 21st, 1906.

HYLOICUS (SPHINX) PINASTRI.—Yesterday I noticed an example of this fine moth at rest on a pine-trunk. The specimen was in bad condition, as one might suppose considering the date, but I was none the less pleased to see it, as it shows the species is still maintaining itself, and has not died out from its old haunt as I had feared. Its occurrence in the garden of the old Rectory here, extending over a period of thirty years, may be of interest. The first capture was made by one of my brothers in 1875, another in 1876 or 1877, and a third in 1879. Then came a long interval; no more were noticed until 1893, when I was fortunate in securing three larvæ. In 1894 my brother captured a fine imago on July 1st; and in 1899 a larva was found late in September and given to me by the gardener. Since the latter date, although careful search has been made, no sign of this moth has been seen, and I was therefore very delighted to see it again yesterday.—(Rev.) A. P. WALLER; Waldringfield Rectory, Woodbridge, August 13th, 1906.

LEUCANIA FAVICOLOR IN THE ISLE OF SHEPPEY.—Whilst sugaring for *M. abjecta* early last month, I took six specimens of *L. favicolor*, both red and yellow varieties, on the salt marshes near Queenborough. This is, I believe, the first record for *L. favicolor* in the Isle of Sheppey.—J. J. JACOBS; 63, Marine Parade, Sheerness-on-Sea, August 15th, 1906.

EPIONE ADVENARIA, &c., IN OXFORDSHIRE.—On May 28th of this year I netted a specimen of *E. advenaria* in good condition on the slope of the Chiltern Hills, near Watlington. I have also met with the following insects on the hills not hitherto, I believe, recorded for the county. *Eupithecia pusillata* occurred sparingly among spruce in two localities for the last three years, and at one of these localities *Coccyx pygmæana* was found in some abundance. In June, 1903, I took two perfect specimens of *Agrotis cinerea* at sugar at places a mile

apart.—JOHN W. B. BELL; Pyrton Vicarage, Watlington, Oxon, August 14th, 1906.

DEILEPHILA (PHRYXUS) LIVORNICA IN NORTH SOMERSET.—A fairly perfect specimen of the striped hawk moth, which had been taken at rest inside a room, was brought to me on the 3rd inst.—BERNARD B. GOUGH; Compton Martin, near Bristol, August 6th, 1906.

DEILEPHILA (PHRYXUS) LIVORNICA IN KENT.—Mr. Sydney Webb, of Dover, informs me that a living specimen was brought to him on August 20th last.—RICHARD SOUTH.

DEILEPHILA (PHRYXUS) LIVORNICA IN SOUTH DEVON.—We understand that quite a number of this species were taken at Paignton and Torquay in June and July last.

HELIOTHIS PELTIGER AT LEWES.—I, to-day, captured a fine male specimen of this insect flying in the sunshine on a slope of the South Downs.—PHILIP H. VINALL; 220, High Street, Lewes, August 24th, 1906.

On July 18th last I found a larva near Lewes, feeding on *Ononis*, which I could not determine to my satisfaction. On the 15th inst. the question was settled by the emergence of a fine specimen of *Heliothis peltiger*.—HUGH J. VINALL; 3, Priory Terrace, Lewes, August 24th, 1906.

HELIOTHIS PELTIGER IN SOUTH DEVON.—During May this species was frequently taken at flowers of valerian; and larvæ were very plentiful during June and July feeding on rest-harrow. An example of the second brood was captured at bramble-blossom on August 11th. Ova were obtained from two females, but the larvæ from these died off before attaining full growth. The smaller larvæ collected from rest-harrow also failed to mature, and it was found that only those larvæ that were nearly full grown when taken reached the pupal stage. J. WALKER; 3, Goodwin Terrace, Carlton Road, Torquay.

ARGYNNIS PAPHIA *var.* VALESINA IN GLOUCESTERSHIRE.—On Saturday, August 11th, I spent an hour on the hills above the town of Wotton-under-Edge in order to obtain some fresh specimens of *Vanessa cardui*, which is now in perfection and very abundant. I was taking these along a hedgerow on the flowers of *Eupatorium cannabinum*, and whilst in the act of securing one of them, I saw close to me a specimen of *P. valesina* feasting on the flowers of the same plant. I had my net over it in a minute, and it is now on my setting-board. Within twenty yards I saw a second specimen, but in my anxiety to net it I missed, and it went sailing up over the tops of the beech-trees growing on the other side of the road, and was lost to sight. I wandered a little way on to the verge of Westridge Wood, and here *A. paphia* was in greater abundance than I had ever seen it before, males and females in all directions. *V. io* was everywhere, and I netted one *V. atalanta*, which insect is certainly getting much scarcer—I might almost say very scarce—about here. The chalk hill blues were greatly in evidence on the hillsides. It is now, according to my notes, some twenty odd years since *P. valesina* was captured in Gloucestershire before. It

was about that time taken by Mr. W. R. Newstead at Great Witcomb. V. R. PERKINS; Wotton-under-Edge, August 13th, 1906.

LARVÆ OF CERTAIN SPECIES OF LEPIDOPTERA ABUNDANT.—Has anybody noticed the large numbers of larvæ there are this year? *Smerinthus ocellatus*, *S. populi*, *Saturnia carpini*, *Euchelia jacobææ*, *Orgyia antiqua*, *Dicranura vinula*, *Cerura furcula*, *C. bifida*, *Notodonta ziczac*, *Phalera bucephala*, and *Clostera reclusa* are a few from the many we have taken in the vicinity of the Long Valley and Racecourse. — G. HOBBS; 37, Alexandra Road, Aldershot, August, 1906.

SIREX GIGAS.—On August 21st a very fine female specimen of *Sirex gigas* was caught by Mr. Stephen Reynolds on the summit of Mis Tor, Dartmoor.—H. MCARTHUR; 35, Averill Street, Fulham Palace Road, London, W., August 24th, 1906.

PRIONUS CORIARIUS IN ESSEX.—I captured a female *Prionus coriarius* flying at dusk in my garden here on July 27th. This is the first time I have met with this conspicuous beetle, though, on referring to the 'Entomologist,' I find that it has been taken not uncommonly in Epping Forest, and Fowler records it from Loughton and Colchester. W. S. GILLES; The Cottage, Boching, Braintree, Essex, July 28th, 1906.

PLUSIA NI AND LAPHYGMA EXIGUA AT TENBY.—Whilst collecting with Mr. Spottiswoode Graves at Tenby on June 9th, we secured a worn *Plusia ni*, which laid a few eggs in the collecting-box, and which I succeeded in rearing; the second brood emerging from 24th to 30th July. The larvæ fed freely on broccoli and lettuce. I have also taken at Tenby during August four *L. exigua* at sugar. I believe both species are a new record for Tenby.—J. A. FINZI; 53, Hamilton Terrace, N.W., August 22nd, 1906.

PHIBALAPTERYX POLYGRAMMATA: A CORRECTION.—Owing to the kindness of Mr. E. R. Bankes, of Corfe Castle, I find that the *P. polygrammata* I reported (*ante*, p. 190) as taken at Strensall is only *P. lignata* after all. The mistake arose through my having compared the moth with the figure in Newman's 'British Moths.' I was not aware that the figures on pages 174–175 should be transposed.—(Captain) B. TULLOCH; Broom Villa, Strensall, York, August 16th.

LAPHYGMA EXIGUA IN SURREY.—On August 27th, 1906, I boxed an example of *Laphygma exigua*, which was at rest on a fence near an electric lamp at Kingston Hill, Surrey. The specimen was eventually found to be a female, and has deposited about a dozen ova.—ERNEST WARNE; The Mount, Liverpool Road, Kingston Hill, Surrey, August 28th 1906.

[In addition to the above record Mr. Percy Richards reports three specimens from Kingston Hill in August, and one from Oxshott, August 23rd.—ED.]

LAPHYGMA EXIGUA IN KENT.—I have to report the capture of a grand male (in bred condition) of *L. exigua* here last night. I boxed it while it was fluttering in the grass. Mr. V. E. Shaw was a witness of the capture.—L. W. NEWMAN; Bexley, Kent, August 27th, 1906.

CHRYSOPHANUS PHLŒAS AB. SCHMIDTII IN ESSEX.—My friend Mr. King, who only recently commenced collecting Lepidoptera, this morning took a very fine specimen of *C. phlœas* ab. *schmidtii* at Chingford.—WM. G. PETHER; 24, Wallace Road, Canonbury, N., August 5th, 1906.

NOTES FROM THE WYE VALLEY.—Whitsuntide this year was spent in the Wye Valley, on the Monmouthshire side of the river, between Bigsweir and Redbrook. Favoured with good weather on the whole, I met with some success. The best place for the sun-loving insects was the bank between the railway and the river. Here the three common Pieridæ, *Euchloë cardamines*, *Argynnis euphrosyne*, *Syrichthus malvæ*, *Nisoniades tages*, and *Euclidia glyphica*, were about in numbers, and the following less commonly: *Gonepteryx rhamni*, *Vanessa cardui*, *Pararge megæra*, *Polyommatus phlœas*, *Lycæna alexis*, *Euclidia mi*; and one *Anaitis plagiata* was found on a post in the full sun. *Heliaca tenebrata* appeared in the same locality amongst the long grass towards evening. From the railway bank a delightful path leads through the woods back to the village, in a lateral valley where I was staying. By beating and dusking along this footpath I obtained a lot of Geometræ, including *Epione advenaria*, *Ephyra punctaria*, *E. annulata* (*omicronaria*), *Numeria pulveraria*, *Minoa murinata* (*euphorbiata*), *Emmelesia affinitata*, *E. albulata*, *E. decolorata*, *Cidaria corylata*, and *Herminia grisealis*; while a few *Melanippe hastata* were found flying in the sunshine. There were not many insects to be found in the higher ground, but of course *Venilia maculata* and *Ematurga atomaria* were common in suitable localities, and a few *Cidaria suffumata* were netted at dusk. One *Ligdia adustata* was beaten out of a hedge near Bigsweir. I did not do any larva-beating, but found a batch of forty *Tæniocampa miniosa* on a twig of oak. Larvæ of *Hybernia defoliaria*, and of course *Cheimatobia brumata*, swarmed, and a few *Abraxas grossulariata* were noticed. From a bed of nettles near Llandogo I took twenty larvæ of *Botys ruralis* in about half as many minutes. I was successful in obtaining a number of ova from *Epione advenaria* and *Tortrix ministrana*, but could only induce females of *Melanippe hastata* and *Ephyra punctaria* to lay a few each.

Not much work was done with the Diptera, but with the kind assistance of Mr. H. W. Andrews I have been able to name the following:—*Tipula gigantea* (one), *Atherix ibis* (one), *Dioctria ælandica*, *Chilosia variabilis*, *Leucozona leucorum*, *Rhingia campestris* (common), *Volucella bombylans*, *Eristalis nemorum*, *E. pertinax*, *Xylota lenta*.

Very few Hymenoptera were noticed, beyond the common bumblebees, but I found two localities for *Eucera longicornis*, in one of which it was very common.

The following is a full list of the Lepidoptera observed:—*Pieris brassicæ*, *P. rapæ*, *P. napi*, *Euchloë cardamines*, *Gonepteryx rhamni*, *Argynnis euphrosyne*, *Vanessa cardui*, *Pararge megæra*, *Polyommatus phlœas*, *Lycæna icarus* (*alexis*), *Syrichthus malvæ*, *Nisoniades tages*, *Hylophila prasinana*, *Spilosoma lubricipeda*, *Tæniocampa miniosa* (larvæ), *Heliaca tenebrata*, *Euclidia mi*, *E. glyphica*, *Epione advenaria*, *Rumia luteolata*, *Venilia maculata*, *Odontopera bidentata*, *Iodis lactearia*, *Ephyra punctaria*, *E. annulata* (*omicronaria*), *Asthena candidata*, *Acidalia remu-*

taria, Cabera pusaria, C. exanthemata, Panagra petraria, Numeria pulveraria, Ematurga atomaria, Minoa murinata (euphorbiata), Abraxas grossulariata (larvæ), *A. sylvata, Ligdia adustata, Hybernia defoliaria* (larvæ), *Cheimatobia brumata* (larvæ), *Emmelesia affinitata. E. albulata, E. decolorata, Eupithecia castigata, Melanippe hastata, M. montanata, Coremia designata, C. ferrugata, Cidaria corylata, C. suffumata, Anaitis plagiata, Herminia grisealis, Aglossa pinguinalis, Botys ruralis* (larvæ), *Scoparia ambigualis, Crambus pratellus, Tortrix ministrana, Penthina sororculana (prælongana), Ephippiphora pflugiana, Nemophora swammerdammella, N. schwarziella, Gelechia ericetella, Harpella geoffrella, Glyphipteryx fuscoviridella.*—PHILIP J. BARRAUD; Bushey Heath, Herts.

SOCIETIES.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*May* 21*st*, 1906.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. C. J. Wainwright, referring to Mr. Bradley's exhibit of *Cheilosia velutina*, Loew, at the last meeting said that on reference he found that he had four males and three females, taken at West Runton at the same time Mr. Bradley took his. He said the insects did not tally exactly with Becker's own description of *velutina*.—Mr. W. E. Collinge showed Coleoptera from an old beech at Erdington.—Mr. Wainwright, various Lepidoptera.—Mr. J. Simkins, fine forms of *Tæniocampa incerta*, Hufn, and other Tæniocampidæ, &c., from Solihull.—Mr. G. T. Bethune-Baker, various new species of Lycænidæ from Africa, New Guinea, &c., and communicated a paper in which they were described.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

1. *A Text-book of Botany.* By J. M. COULTER, A.M., Ph.D. 320 figs. Sidney Appleton. 1906.
2. *British Flowering Plants.* By W. F. KIRBY, F.L.S., F.E.S. 120 coloured plates. Sidney Appleton. 1906.

So much do the vegetable and insect worlds interact the one on the other that no entomologist can afford to be altogether ignorant of botany. In No. 1 he will find an excellent up-to-date book, which will give him a real insight into the subject. Besides being treated in a way that anyone may understand, the subject is elucidated by very many illustrations, many being photographic. The entomologist may perhaps like best the chapters on "Flowers and Insects" and "Plant Associations." No. 2 does not profess to teach botany, but is intended to assist in the identification of, and to provide information about certain British flowers. Written by so well-known an entomologist as W. F. Kirby, we are not surprised to find many insects referred to. The notices of the plants are concise and interesting, and should serve their purpose well. The pictures are often rather crude, both in draw-

g and colouring, but still they will usually enable the user easily to ntify the plants figured. Complaint is made in the preface that the thor cannot notice "every species or even every genus of British ants," yet space is wasted on some common plants like the cowslip, d quite a number of non-British species are introduced, which, sides making the title incorrect, gives one the impression (erroneous doubt), that the text was written to suit the plates.

Annals of the Natal Government Museum. Vol. i. pt. i. Edited by E. Warren, D.Sc. Lond. London: Adlard and Son. 1906.

The editor is to be congratulated on this production. The plates e of the very first order. We look forward to some entomological ticles in future numbers.

On the Life-histories of the Ox Warble Flies Hypoderma bovis, (De Geer) and H. lineata (Villers). By A. D. Imms, B.Sc. Lond. Pp. 18, including a bibliography of the subject. Journal of Economic Biology, vol. i. pt. 1, 1906.

Diversities among New York Mosquitoes. By Dr. E. P. Felt. New York, 1906. From Proceedings of Second Anti-Mosquito Convention. 18 pp., with fourteen plates and other illustrations.

Means of distinguishing mosquitoes are discussed.

L'Enseignement de la Zoologie appliqué à l'Agriculture. By F. V. Theobald, M.A. 1905. 15 pp. Contains, besides other matter, suggested courses of study.

Ueber der Laich der Trichopteren. Von A. J. Silfvenius, Mag. Phil. Helsingfors, 1906. (Acta Societatis pro Fauna et Flora Fennica, 28, no. 4.) Pp. 128, including a bibliography and 2 plates.

W. J. L.

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strations of British Blood-sucking Flies. With Notes by Ernest Edward Austen, Assistant, Department of Zoology, British Museum. Pp. 74, with 34 coloured plates. Natural History Museum, South Kensington. 1906.

Of the blood-sucking flies known as midges, gnats, horse-flies, gs, brimps, &c., most residents in the country, or visitors thereto, l have at some time had more or less unpleasant experience. To me persons the hum of *Tabanus bovinus* is more disconcerting than e challenge of an angry bull; such people have had experience the insect as a rural phlebotomist, and dread a repetition of the eration. The silent-winged and ubiquitous *Hæmatopota pluvialis* is e fly which most frequently draws blood from the entomologist, but e latter is also well acquainted with the bump-raising powers of itish species of *Anopheles*, *Culex*, &c., which Mr. Austen, in the lume before us, states "are as much entitled to be called mosquitoes are tropical species belonging to the same genera."

It is estimated that there are some seventy-four blood-sucking es in Britain, and enlarged portraits of the most important of these

will be found on the thirty-four plates on this most valuable and exceedingly attractive book. These plates are of exceptional merit, and have been reproduced from water-colour drawings by Mr. A. J. Engel Terzi, which are, or will be, on view in the North Hall of the Natural History Museum at South Kensington. In the notes, furnished by Mr. Austen to accompany the plates, much information of general interest concerning these insects is given, and technicalities have been minimised. There are remarks on the life-histories of the species, and on their distribution both in Britain and abroad.

Transactions of the City of London Entomological and Natural History Society for the year 1905. The London Institution, Finsbury Circus. 1906.

In addition to the usual interesting matter comprised in the "Reports of Meetings," there are some capital papers in this little volume of sixty-two pages. Mr. Louis B. Prout's contribution on "The British Species of *Perizoma* (*Emmelesia*)" (20 pp.) is perhaps the most important. Mr. Pickett's paper refers to the aberration of *Lycæna* (*Polyommatus*) *corydon*; and the Rev. C. R. N. Burrows has some informative remarks on *Orgyia gonostigma*.

Proceedings of the Hawaiian Entomological Society for the year 1905. Pp. 36, with Index and 2 Plates. Honolulu, 1906.

Considering that this Society only came into being on December 15th, 1904, the inital volume of its Proceedings is a remarkably good one. The main object of the Association is "to promote the study of entomology, and to encourage friendly relations between those in any way interested in the science." Up to date of publication the membership was twenty. The President in 1905, and nominated for 1906, is Mr. R. C. L. Perkins; the Editors of the Proceedings are Messrs. G. W. Kirkaldy and Otto H. Swezey. The two plates, which are well executed, represent mouth-parts of Tenthredinidæ.

The Agricultural Journal of India. Agricultural Research Institute, Pusa. Calcutta: Thacker, Spink & Co. 1906.

We have received Parts 1–3 of this Journal, which is published quarterly, and is the official organ of the Department of Agriculture in India. The contents, which, in the present numbers, are chiefly of importance to the agriculturist and economic entomologist, are, some of them, contributed by others than the officials of the department. The eighteen plates, one of which is a photographic group of officials, and another comprises coloured figures of "Moths of Hairy Caterpillars," are exceedingly well done, and these, and the contents as a whole, will be of interest to entomologists generally.

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IMPERFECT MOULT IN A LARVA OF *AMORPHA* (*SMERINTHUS*) *POPULI*.

By T. A. Chapman, M.D., F.Z.S. &c.

Mr. South forwards to me a larva, given to him by Mr. Norman Riley, of *Amorpha* (*Smerinthus*) *populi* in its last instar, the victim of an accident at moulting, *viz.* the retention of the larval head of the previous skin, the moulting otherwise being successful. This accident is not very rare, and is more or less familiar to those who breed many Lepidoptera. I fancy I have seen it perhaps fifty times. A short memorandum on the condition of such a larva may be useful, as I do not for the moment recollect any notice of it in our text-books or magazines.

At moult the new head is much larger than the old one, and the difficulty of the new head being within the smaller old one is overcome by its leaving the old one and occupying the prothoracic segment of the old skin. Room is made for it there by

the distension of the membrane uniting the prothorax with the head on one side and the mesothorax on the other, and to some extent by the compression of the prothorax itself. My command of terminology is not sufficient to enable me to express myself briefly, and yet avoid (from a purist point of view) talking nonsense. Thus, to talk of the old head and the new head is, strictly speaking, nonsense. There is only one head; what is old and new is the hard chitinous covering or cuticle—hard on the mature head, soft at, and for a short time after, each moult. This hard covering is cast at each moult, and the first stage of the exuviation is this retreat of the head proper into more expansible quarters. The mouth-parts only, remain in the old head, the space in which, that they do not occupy, being filled with fluid, the same fluid that bathes the larva under the old skin. I believe that when the skin is actually cast the larva laps up the remains of this fluid, as the head is full of it just before, but is quite empty, if not dry, as soon as it has taken place.

In the moult to pupa the head always splits up, but in larval moults it remains entire. There is much variation as to one detail, bearing closely on the accident or malformation under consideration.

In some species the head remains attached to the cast skin, more or less fixedly. This may be readily seen in the cast skins of the larvæ of the gregarious Vanessas as they remain attached to the larval webs. In other cases they are so lightly attached to the skin that they fall away from it almost at once. In the majority of cases, amongst Noctuæ, &c., the head is separately detached. In the breeding-cage these heads will be found lying on the floor, whilst the skin proper remains attached to the larval resting-place, except when the larva eats it, as often is the rule (the head is never eaten). In this section the old head is not drawn off by any traction of the old skin when it slips backwards, but seems to be quite loose, and falls off. Whether it be the rule in certain species, or only an exception occurring in some individuals, one often notices the old head has to be shaken off by the larva, or even rubbed off against the surface the larva rests on. Whether this is the rule in some species or not, it is usually, I think, pathological, and is a step in the direction of Mr. South's specimen. In this instance the old head remains in the position it occupied, after the new head had taken up its quarters in the prothoracic skin, the moult in all other respects being successfully accomplished. This accident is, in my experience, always fatal; the larva is effectually muzzled, but more than this, the muzzle is of a special character. It can, in nine cases out of ten, be readily removed by a little force, but the new head has hardened in the muzzle, and the circular opening has impressed itself round the base of the

mouth-parts, pinching in a circular depression, and so deforming the relations of parts that the mandibles are quite useless and unable to bite. When the head falls off normally, and the new head is relieved from the pressure of the old skin and head, it undergoes some little further expansion before it hardens; it is probably this expansion that normally makes the old head fall off, but when it does not, it results in the strangulation above the mouth-parts and the accompanying deformity.

When a larva fails in this or any other way to moult successfully, there is usually some ascertainable cause; often removal from the silken carpet or cocoon spun for the occasion has a disastrous effect; some debility, as by rearing in captivity under bad conditions, may frequently be suspected. In the larva of *A. populi* under discussion a cause of debility is very evident; it has no caudal horn, the site of the horn is occupied by a vacancy in the yellow stripes. There can be little doubt that the horn was lost by some accident, bitten probably by one of its brethren, the larva being one of a brood reared together, and by this accident, probably in the previous instar, whatever it was, more or less general damage by bleeding probably occurred, as well as the local injury.

Betula, Reigate, September, 1906.

LARVÆ OF *LYCÆNA BELLARGUS* AND THEIR ASSOCIATION WITH ANTS.

By A. L. Rayward.

Since finding larvæ of *Lycæna corydon* in association with ants—as reported by me in the last number of the 'Entomologist'—I have been desirous of discovering the larva of *L. bellargus* in its natural habitat, as from the fact that it is very similar in its structure and habits to that of *corydon*, and feeds on *Hippocrepis comosa*, which is one of the food-plants of that species, I was led to expect that it might be similarly associated with ants, and be possessed of as highly-developed a secretory gland as that found on the dorsal surface of the seventh abdominal segment of its ally.

This expectation proved to be well-founded, for of seven full-grown larvæ of *bellargus* taken by Mr. A. Harrison and myself at Folkestone on August 11th and 12th last, at least two had ants upon them when found, and in one instance an ant was observed to be busy stroking the gland with its antennæ in the endeavour to excite the flow of the liquid secreted by that organ, and with the desirable qualities of which it was evidently familiar.

The ants found attendant upon these larvæ were black, and of a different species from those discovered associated with the larvæ of *corydon* at Reigate, which were *Formica flava*; oddly enough, however, I was unsuccessful in my efforts to obtain a demonstration of the function of the gland by means of these black ants, some of which I brought with me on my return from Folkestone, while complete success attended the first attempt when an example of *F. flava*—taken from a nest introduced some time ago into my garden for the purpose of experimenting with the larvæ of *L. arion*—was made the medium.

Possibly *flava*—which is common on the *bellargus*-affected hillslopes at Folkestone—is more generally associated with these Lycænid larvæ than are other species of ants, and the instinct for "nursing" more highly developed than is the case with the black ants referred to, which have been identified for me as workers of *Lasius niger*.

That ants are not essential to the well-being of *corydon* or *bellargus* appears to be certain, as both species have, I believe, been successfully reared through from the egg without any intervention or assistance from them, and a brood of the latter species, reared by me last year from ova deposited in captivity, were kept under conditions which certainly precluded the possibility of their aid. It appears probable, nevertheless, that under entirely normal conditions ants may protect the larvæ in some measure from the attacks of their natural enemies, and, if that be so, the relationship would seem to be a mutually advantageous one.

Wallington: Sept. 19th, 1906.

SOME NOTES ON SCANDINAVIAN AND LAPLAND BUTTERFLIES.

By H. Rowland-Brown, M.A., F.E.S.

(plate vi.)

My plans for an entomological excursion to Sweden had been carefully arranged before I left England, and arrived at Gotenburg in the middle of June last. My original itinerary comprised an expedition to Narvik, the terminus of the Ofoten Railway, crossing thence to Swedish Lapland, and reaching Abisko on the Torneå Lake about the end of the month. But advices from Herr J. Sparre-Schneider at Tromsö, who kindly furnished with much local information, decided me to reverse the order of my going. The season of 1906 in the higher north, owing to the depth and quantity of the snow, was evidently very

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SNOW MOUNTAINS AND BIRCH FOREST, ABISKO, SWEDISH LAPLAND.

late, and with this in mind I determined to see what I could of Southern Sweden first, and so time my arrival in Lapland as I anticipated with the height of the summer. My forecast—sanguine in every respect both as to time, occasion, and results—was, however, doomed to disappointment, and, although in the five weeks or so I was in Scandinavia I experienced in every other respect much that was delightful as well as novel, the Fates were dead against my butterfly hunting from start to finish; not because I hit invariably the wrong localities, but chiefly because the skies were persistently overcast, though the weather was otherwise fine, and the heat sometimes quite suggestive of the "Midi." My brethren of the net will, I feel sure, sympathize with me under these entomologically depressing conditions; the more so when I say that hardly a day passed in Lapland without the sun bursting forth in full splendour at about 11 p.m., and remaining in a clear sky until 3 or perhaps 4 a.m. Meanwhile, I had equipped myself with all available information as to localities, and further was glad to hear from Prof. Aurivillius that the headquarters chosen by me north of the Arctic Circle was largely unexplored ground for insects. For the benefit of any collector who should chance to follow in my footsteps—and the enterprise of the Swedish State Railways, coupled with the good pioneer work of the Swedish Touring Club, is rapidly developing these hitherto inaccessible regions—I venture to suggest one or two works as useful guides, for the majority of which I am indebted to Herr Sparre-Schneider, the Conservator of the Tromsö Museum and a scientist thoroughly acquainted with the insect-fauna of Finmark. But Herr Lampa's Swedish lists are rendered much less useful than they would be otherwise by the omission of dates, and this under the peculiar conditions of the Scandinavian climate is, of course, a serious drawback. Nor does there seem to be any recent Swedish work on the subject to assist the ordinary collector; though possibly a better knowledge of the language would have helped me to discover something of the kind in the Stockholm Natural History Museum. Prof. Aurivillius's 'Nordens Fjärilar' (1888–91), with its excellent letterpress, and luminous woodcuts in such striking contrast to the wretched coloured plates which represent any other butterflies than those of Scandinavia, is therefore the best handbook in print, so far as I know; while, save in the environs of the Capital, there have not been such developments, either of building or of industries, as to destroy old localities, and I fancy, given the right conditions, I should have found most of the Lapland butterflies as plentiful—or otherwise—in the haunts where they were recorded by Wallengren and by Zetterstedt over half a century since. It is, therefore, principally with the hope that I may be able to put dates to the emergences of species actually

encountered that I venture to place these few remarks before your readers.

The day I arrived in Gotenburg, after a passage in the s.s. 'Calypso' from Hull of unruffled calm and consequent comfort, was brilliantly hot with a clear sky, and I at once determined to pay a visit to Trollhättan by rail, since it was rumoured that all the seats and berths on the Gotha Canal-boat were booked, and I had no desire to be included among the congested crews. The season—at all events, in this part of Sweden—appeared to be well advanced, and I presently discovered that the southern half of the peninsula was suffering from an unusual drought. On the railway to Trollhättan I saw a single specimen of *Papilio machaon*, the only example encountered, though I was informed later by a young collector whom I met that he found the larvæ not uncommon in this neighbourhood. On the hills surrounding the famous waterfalls, and through the shady pine-woods, *Pararge mæra*, a typical form but very dark, was everywhere in evidence, while I also noted, more or less commonly, *Cœnonympha pamphilus*, *C. arcania* (one), and *Pieris rapæ*. These butterflies presented no marked difference from those of their species encountered elsewhere on the northern continent, and the same may be said of the little bag I made next day at Jönköping, the pretty town which lies at the southern end of Lake Vettern. Here in the public park—a wide stretch of heath, marsh, and woodland—I found a pleasing variety, though I should have worked this single afternoon with considerably more zeal had I realized that this was the last of the sunshine at suitable collecting places for many days to come. Indeed, so misty and threatening was the weather next morning that I had to abandon altogether my steamer trip to Stockholm by lake and canal, and to take train direct. I had, however, time to make the acquaintance of a fine form of *Polyommatus hippothoë*, of which the males were more or less worn, but the females large and fresh, with a wide tawny suffusion on the upper wings. They haunted a little ditch at the edge of a copse, by the side of which the grass grew tall and rank, and divided the honours with *Argynnis selene* (typical but small), *A. euphrosyne*, *A. ino* (males), in fine condition, and occasional *Melitæa athalia*, while on the dusty road *P. mæra* was again conspicuous; the males with a supplementary well developed small eye-spot above the customary ocellation on the upper side of the fore wings.

The neighbourhood of Stockholm is scarcely favourable to butterfly life, and I saw very few species on the many pleasant excursions, which for a week or so now occupied my time—these undertaken mostly by steamer to one or other of the resorts to which all good Swedes betake themselves when the days lengthen out into twenty-four hours of sunshine and twilight. I do not note having met with any butterflies at all actually in the capital,

where there are several well-planted, flowery public gardens; but on June 29th, on the island of Vaxholm, where there are fine fir-woods and heathy commons among the many well-cultivated enclosures, I observed *Pieris brassicæ*, *Vanessa urticæ*, *Argynnis lathonia* (one), a fresh specimen of *Grapta c-album*—which puzzled me somewhat, as I cannot now determine to what brood it belongs, though it must surely have been a hybernator—*Pararge mæra* (similar to the Jönköping form), *Cœnonympha pamphilus*, and *Lycæna icarus* (males).

July 3rd should have seen me on my way to the far north, but, having proceeded in the morning by boat to Upsala to visit the University and the grave of Linnæus in the beautiful cathedral, there was some mistake about booking my berth on the Lapland Express; and, having boarded the train, I discovered that I could get no further than Bräcke. As there would not be another *direct* train for three days, I determined to see something of Jemtland, and proceeded to Östersund, a charmingly situated town on the Storsjö, where I awaited the boat which was to steam that day to Hallen, in the heart of what promised to be, entomologically speaking, a fine country. Having some six hours to spend here, I at once took out my net, and made along the railway, which is the connecting-link with Throndjem and Central Norway generally, and presently came upon some likely ground, where the spring flowers of our English woods were now in full bloom, the pink campions making a splendid show in all suitable situations. But once more the sun, which had hitherto shone with some brilliancy, played truant. I had noted *P. hippothoë* var. *steiberi*, the males not uncommon, and a little coppice produced *Lycæna argus*, L., and *L. argyrognomon* var. *ægidion*, Meissner, with the only *Leptidia sinapis* I met with in Sweden; but I had scarcely entered the outskirts of the woods when down came the rain, and, though it cleared somewhat for a few moments at a time, the butterflies refused to fly. On the lower saplings, however, I discovered not a few *Chrysophanus amphidamas*, but so worn as to be wholly useless for cabinet purposes. The day, moreover, resulted in the loss of my only pair of forceps—a disaster which travelling collectors will fully appreciate. A cold wet journey across the lake of some two hours, and I reached Hallen, the aspect of which at once determined me to accept the proffered hospitality of a seat on an hotel carriage destined for Bydalen—yet another three hours' drive, during which it poured incessantly. However, the morning of the 5th actually dawned fine, and I enjoyed, in the fitful intervals of sunshine, which lasted up to about two o'clock, some novel collecting in lovely country reminiscent of the lower and warmer valleys of the Alps. But it was curious to note that almost every butterfly I met with was outside the flowery meadows, which seemed here to offer little attraction to insects of all orders. By the river, on a piece of

waste, I found *Argynnis pales* var. *arsilache*—a grand form with heavily marked males, and larger than the type, such as it appears in the Central Alps; while *A. euphrosyne* var. *fingal* and *A. selene* var. *hela* were also not uncommon among the raspberry-bushes and campanulas bordering the road up which I had come the previous night. Here also I was presently to make my first acquaintance with the typical Scandinavia *A. frigga*, not always easy to distinguish on the wing from the light form of *A. thore*, which is the var. *borealis* of Staudinger, and described somewhat inadequately, I think, as "multo dilutior." I found also *C. amphidamas*, again, but even more battered than at Östersund, with quite typical female *L. icarus*, and few male *Pieris napi*, and *C. phlœas* presenting no special distinction. July 6th was devoted entirely to journeyings round the Storsjö, upon which there was no connecting steamer with Östersund; but, though it took me practically the whole day to get back to Bräcke by carriage, ferry, and rail, the road lay for the most part through splendid marsh and forest, containing I know not what entomological possibilities in the way of those Œneidi and Scandinavian Erebias for which ultimately I was doomed to have travelled some two thousand odd miles in vain!

Picking up the Lapland Express in the early morning of the 7th, I now proceeded direct to Abisko on the Torneträsk, through interminable forests, over vast rivers spanned by swinging bridges, past lonely sidings, where ever and again the thirsty engine paused for water, and then perhaps through miles of desert marsh, where the seeded cotton-grass, suggestive of *Cœnonympha davus*, nodded in the fresh sweet wind like a million suspended pearls.

A more comfortable and picturesque journey I have never made. The "express" is a leisurely affair compared with the "flyers" of France and England; it is capitally appointed with restaurant, and the roomiest sleeping berths in which I ever travelled, while the fare for a journey in distance equal to that of Stockholm to Rome, costs less than three pounds, second class; the second class being in every way equal in comfort to the "first" of other countries. Already the Swedes have made their "Världens Nordligaste Järnväg" the most favoured of tourist excursions; while the "Svenska Turistförening"—which I had joined, and advise every traveller in Sweden to join—has made Lapland easy of access by means of its "huts" planted at favourable centres for tourists, and naturalists in search of happy hunting-grounds. The so-called "hut" at Abisko is, in fact, a small hotel, built of the inevitable birch wood, scrupulously clean (as every inn in Sweden), and managed by a lady whose command of modern languages is as thorough as her capacity to keep and maintain in perfect comfort and temper thirty or so tourists, upon whom the mosquitoes descend in

overpowering force so soon as they show their noses unveiled outside the doors over which waves the gay blue-and-yellow flag of the Fatherland.

Of the Lapp mosquito there is nothing good to be said, and woe to the Briton who comes unprovided with a regular veil, and enough fine muslin at least to fill the windows of his sleeping-room during the brilliant sunshiny nights. I found nothing that would keep them at bay. The first three days I was at Abisko there was no ray of sunshine; only hot cloudy weather, and the mosquitoes consequently in tormenting myriads. When I did start collecting again, on July 12th, I was encased in stout boots, riding breeches and leather gaiters, buckskin gloves (to which presently I was compelled to safety-pin my sleeves, as the brutes settled savagely on my wrists), and a long veil, which effectually prevented my spotting any small butterfly at a distance. This latter I abandoned as the sun grew hotter, for the mosquitoes then descend into the grass, and are only troublesome to the face in the birch-woods, with which even in this latitude the mountains are plentifully forested—not the little dwarf shrubs common to less favoured regions until the arctic creeping variety alone survives—but tall upstanding trees that take the sense with sweet perfume suggestive of spring woods, and the fair mythology which lends a charm even to the nomenclature of Scandinavian butterflies.

The marshes that lie between the railway and the lake into which the Abisko river falls with a Niagara-like torrent of cold green water—at this season, at all events—appeared almost entirely devoid of butterfly life. Except a single *Colias nastes* var. *werdandi*, Zett., and sporadic *Lycæna optilete* var. *cyparissus*, Hb. (if variety it really be), I found nothing; only a few Geometers kicked up from the ground-growth of moss, or disturbed from the scattered birches. The best collecting-ground—indeed, the only productive ground—was in a lateral valley on the left bank of the river inland from the railway, and here, right up to the snow-line, which was very low in this backward season, I met with all the butterflies which I have to report. They are few in species, but, with the exception of *Argynnis freija*, were individually plentiful, *A. thore* var. *borealis* notably so, swarming in the open glades of the woods which abutted on the stream; while *Colias* var. *werdandi* became commoner with each upward step, though, to my surprise, it was hopelessly battered in nine individuals out of ten—a fact all the more remarkable, seeing that spring insects like the Argynnidi were only just emerging. *Werdandi*, then, must be among the first arrivals; and it was the only *Colias* I met with in Lapland. On the high banks facing the sun, and well flowered, *L. icarus* and *L.* var. *cyparissus* were very common, though not in such numbers as the little *L.* var. *ægidion*, which has a curious habit of lying flat on a leaf or

flower-head for protection. I took two very fine *icarus* females (=var. *cærulea*), completely suffused with sky-blue to the wing margins, with brilliant orange ocellations on the margin of the fore and hind wings alike, and in size equal to the largest males. They seem most to resemble the Sligo specimens described and figured (Pl. II. fig. 11) in the 'Entomologist,' vol. xx. p. 74, by Mr. South, or rather to come between this and the figure of *L. bellargus* var. *ceronus* (Pl. II. fig. 12), while the only male retained is referable to the ab. *icarinus*, Scriba. Meanwhile, on the hawkweed, *Erebia ligea* var. *adyte* was not uncommon, and in superb condition; and flitting restlessly up the river-bed, and over the rocks, occurred a fine brightly-marked form of *E. lappona*, of which some were the ab. *pollux*, Esp., with the central band on the under side of the hind wings tending to obsolescence; though in some examples the band is very sharply defined; while it is perhaps worth remarking that the ocellations of the lower wings, where not absolutely obsolete, are in all my six examples reduced to mere black spots. With them, and higher up, *Argynnis pales* var. *lapponica* was in profusion, but the two or three *A. euphrosyne* I captured belong, not as might be expected, to the smaller and darker var. *fingal*, but are in every way similar to the typical form of the English woods. *A. selene* I did not meet with at Abisko in any form. But among the fritillaries, I have since identified one rather worn male *A. aphirape* var. *ossianus*, and a very fresh female, so I must have overlooked this species on the spot—a matter of some disappointment, as I did not meet with it elsewhere. Of the skippers, the only species captured was *Augiades comma* ab. *catena*, singly. *Pieris napi*, just emerged, with one very tawny ab. *bryoniæ* (female), represented the "whites." The Vanessidæ were entirely absent, as well as the Parnassidæ, of which family the only example I saw in Sweden (where it occurs commonly enough on the southern and central mountains, I believe) was beside the railway near a station named Skorped, in Angermanland. With further occasional *Polyommatus* var. *steiberi*, I do not remember to have observed any other butterflies at Abisko, and must conclude therefore that I was much too early on the ground, which, being at an elevation of about 1100 ft. above the sea-level, and at rather more than sixty-eight degrees north, would evidently be better investigated in a late season like this some weeks later in July. As it was, the country further north-west along the railway to the frontier, which I visited in excursions to the beautiful Björkliden Fall, and the Lapp encampments at the head of the Torneträsk, on Pålnoviken Bay, was promising in appearance, with an abundant flora and much grass; but save as producing a few more Geometers, picked up by the lake-side, the days I made these little expeditions were all against collecting other than pleasant recollections and photographs of the primitive people whom so far contact

with railway civilization has done little to alter. Had I known before I met a tourist at Abisko that Kvickjock is now to be reached from Luleå and Jockmock without the least difficulty, I think I should have divided my attention in Lapland between these two places. As it was, I had made arrangements to return by the Norwegian coast, and on July 15th (the weather having again reverted to the worst), I determined to try my luck on the "other side," taking, the same afternoon, a steamer from Narvik—which in its surroundings promises well for entomological research—and, after yet another cold and wet day, arriving at Hammerfest towards the evening of the 16th.

(To be continued.)

ON SOME NEW GENERA AND SPECIES OF INDIAN ICHNEUMONIDÆ.

By P. Cameron.

ICHNEUMONINI.

Lissichneumon, gen. nov.

Metanotum impunctate, shining; the areola longer than wide, its apex transverse, the base open, confluent with the lateral areæ, the lateral two being also confluent; the spiracular area open at the base on the outside; the spiracles linear. Scutellum keeled at the base. Petiole long, slender; the base slightly broader than it is high. Ventral keel distinct to the apex of the fourth segment. Areolet large, 5-angled. Transverse median nervure received shortly beyond the transverse basal; the disco-cubital broken by a stump.

The body is very smooth and shining; the first abdominal segment is longer and more slenderly built than usual, the post-petiole not being defined, the apical half becoming gradually, but not much, dilated; there are eight segments. Apices of tarsal joints spinose. Apex of clypeus bluntly rounded. Gastracœli shallow, small, smooth, the apex widely distant from the base of the segment. Base of metanotum with a deep crenulated furrow. Labrum hidden.

The precise affinities of this genus may be left over for discussion when the female becomes known. It should be known by the very smooth and shining (including the metanotum) body, by the confluent areola and lateral areæ of metanotum, and by the long, slender abdominal petiole.

Lissichneumon levis, sp. nov.

Black; smooth and shining, the pleuræ, median segment and coxæ thickly covered with long white pubescence; the face, clypeus, mandibles except at the apex, a line on the inner orbits to opposite the ocelli, a line, gradually narrowed above, on the lower two-thirds of the

outer, a broad line on the pronotum not extending to the base, an interrupted line on the apex of the scutellum, dilated into a round spot at the apex of the keel, yellow; legs red; the four front coxæ and trochanters yellow; the hind coxæ and trochanters black. Under side of antennal scape yellow; the flagellum brownish below. Wings hyaline, the stigma and nervures black. ♂. Length, 12 mm.

May. Simla (Major C. G. Nurse).

Face and clypeus strongly but not closely punctured, the apex of the latter smooth; the apical row of punctures on it separated from the rest; the upper part of front and vertex sparsely, weakly punctured; the part between the ocelli more strongly and closely punctured. Scutellum somewhat densely covered with long white hair. Posterior median area from near the top stoutly, irregularly, longitudinally striated; spiracular area at the base and middle irregularly longitudinally striated; its apex with a few oblique ones.

HERESIARCHINI.

Stenodontus spilocephalus, sp. nov.

Black; the eye orbits except for a narrow line on the malar space, a narrow curved line below the antennæ, a mark in the lower part of the face in the middle, a large, wide, oblique mark on the sides of the clypeus, a line on the base of pronotum, one on the sides above, two lines on the middle of mesonotum, on the apical half, the sides and apex of scutellum, the scutellar keels, post-scutellum, a mark, longer than wide, on the apex of metanotum on the sides, tubercles, an oblique mark, dilated at the base above, roundly in the middle below, a more regular mark, narrowed at the apex, on the apex below and moderately broad lines on the apices of all the abdominal segments, pale yellow. Antennal scape dark rufous below; the tenth to sixteenth joints white below. Legs red, the four anterior coxæ largely yellow, the posterior black, yellow at the base below, and at the apex above; the trochanters marked with black, the apices of the tarsi blackish. Wings hyaline, the stigma pale testacous, the nervures black. ♀. Length, 9 mm.

Simla. May (Major C. G. Nurse).

Head almost smooth; finely punctured at the ocelli; the pubescence short, white, sparse. Mandibles yellow at the base, the middle rufous, the apex black. Palpi white. Thorax finely, closely punctured; the scutellum more sparsely than the mesonotum; the latter is keeled laterally to shortly beyond the middle. Areola longish horseshoe-shaped; the round base margined by a narrow furrow, not by a keel; the apex is rounded inwardly; the basal half smooth, the apical weakly, irregularly striated; the part behind it is smooth, shining and confluent with the lateral areæ; the apical slope is more closely punctured than the rest. The first abdominal segment becomes gradually widened towards the apex, the post-petiole not being defined. Gastracœli separated, striated at the base, rufous at the apex; the middle segments are closely, minutely punctured; the apex is narrowed; the ovipositor largely projects. Areolet 4-angled, the nervures meeting in front, the recurrent nervure received in the middle; trans-

verse median nervure interstitial; disco-cubital broken by a minute stump.

What I take to be the male has the hind legs almost entirely black and the four anterior are darker coloured; the apex of the scutellum is black. The antennæ are black, stout, serrate towards the apex. The fore coxæ are for the greater part pale yellow; the middle yellow at the apex; the four posterior spurs are blackish, not reddish as in the female.

I should think, from their appearance, that the coloration of the legs varies a good deal.

This species appears to agree with *Stenodontus* (*Gnathoxys*, Wesm.), except that the scutellum is keeled laterally to shortly beyond the middle: according to the generic definitions *Stenodontus* has it margined only at base.

JOPPINI.

GLYPTOJOPPA, gen. nov.

Scutellum roundly convex, rounded behind; the sides not margined. Metanotum deeply, widely depressed at the base, the areola horseshoe-shaped; the other areæ distinct; the segment is short and with the sides broadly rounded. Areolet 5-angled, wide in front; the disco-cubital nervure broken by a very long stump; the transverse median nervure received distinctly beyond the transverse basal. Post-petiole wide, clearly separated; there is a distinct, deep, transverse furrow at the base of the third segment; it is closely striated.

The antennæ are short, taper towards the apex, and are serrate. Temples wide, obliquely, roundly narrowed; the occiput slightly incised. Wings yellowish hyaline, the apex clouded.

The metanotum is more regularly areolated than in typical *Joppini*, but in other respects it agrees more with that group than with the *Ichneumonini*, *e. g.*, in the form of the scutellum, and in the deep depression at the base of the metanotum. Its characteristic features are the roundly convex scutellum, deeply depressed base of metanotum, horseshoe-shaped areola, and the deep, striated furrow at the base of the third abdominal segment.

Glyptojoppa sulcata, sp. nov.

Testaceous, the mesonotum more rufous in tint; the breast, the antennæ towards the apex and the furrows at the base of the third abdominal segment, black; wings hyaline, tinged with yellow; the apex from the stigma smoky; the stigma and nervures testaceous. ♂. Length 14 mm.

Middle Tenasserim, Salween Valley. July (C. T. Bingham).

Head and thorax closely, distinctly punctured, covered with a short fulvous pile; the scutellum has a longer pile; the median segment more rugosely punctured and with a longer and denser pile. Abdomen closely, distinctly punctured, the post-petiole more strongly than the rest; the gastracœli deep, with three oblique keels on the outer side

and three straight ones on the inner side; the furrow on the third segment is wider in the middle and is closely striated there; the sides are smooth.

(To be continued.)

NOTES AND OBSERVATIONS.

PYRAMEIS CARDUI AND OTHER PROBABLY IMMIGRANT SPECIES.—With reference to Mr. R. Adkin's note in 'Entomologist,' p. 173–174, *Pyrameis cardui*, *Plusia gamma*, and *Nomophila noctuella* were abundant on the North Cornish coast on the day of my arrival there, June 2nd last, and during the following week. There seems to have been a great abundance of these three species in the west and south-west of Europe this year. During a recent holiday on the Continent in July and August, I found them wherever I made any observations, including in the following districts: Department of Aisne, some fifty miles east of Paris; in all districts in the Isle of Corsica; the Alpes-Maritimes, a little to the north of Nice; Beauvezer, in the Verdom Valley; and Digne, in the Basses-Alpes. In the neighbourhood of Vizzavona, in Corsica, at an altitude of about 3500 feet, *P. cardui* especially swarmed, and far outnumbered every other large Diurni occurring there. On the evening of the 3rd June, I took my net, and walked at dusk along the top of the cliffs on the North Cornish coast; there was a small light-coloured *noctua* flying about here in some numbers—probably I saw about two dozen specimens. The ground was difficult, however, and I only succeeded in netting four examples. My surprise was great on getting back to my lodgings to find these were *Laphygma exigua*, which, so far as I am aware, has not been recorded from this coast. On the following evening I sugared on the spot, but only obtained one specimen of *L. exigua*. I, however, boxed two examples of *Heliothis armiger* from the sugar. On subsequent nights I obtained at sugar one more specimen each of both these species. Although some of the *L. exigua* especially were perfect specimens, all the examples of both species were in a condition that would lead one to suppose they had flown a long distance, and I have not much doubt but that they had crossed the sea. I may mention that *Heliothis armiger* was common in the neighbourhood of Vizzavona, in Corsica, where it had much the same habits as *Plusia gamma*, settling in the day-time in the grass, and flying off very much after the style of that species when disturbed.—W. G. SHELDON; Youlgreave, South Croydon, Sept. 18th, 1906.

JOINT COCOONS.—I was much interested to see the note under the heading, "Joint Cocoons," in the August number of the 'Entomologist,' as I have had a similar experience in breeding *Malacosoma neustria* and *Eriogaster lanestris* this year. In the case of the former, I imagine that the use of joint cocoons was more or less due to the exigencies of pupation within the comparatively narrow limits of a small breeding-cage. I give the figures, as I think them rather interesting. Forty-

seven full-fed *neustria* larvæ pupated. In three instances four pupated together, in five instances two, and in another three, *i.e.*, twenty-seven pupæ in ten cocoons. A curious result was that, in two of the quadruple cocoons, the first imago ready to emerge proved unable to force an exit, and, consequently, the remaining three were imprisoned, for there was only one exit, and they could not or would not break through elsewhere. In every case they were genuine joint cocoons without so much as the slightest film between the pupæ. The same thing happened with a brood of *E. lanestris*, but on a much smaller scale. In about eighty cocoons there are three instances of joint ownership, three, three, and two respectively. I am not absolutely certain, in this instance, that there is no partition, as they are not due to emerge till next year. But they are not merely stuck together (that frequently happens), but in one lump, so to speak. It may be worth mentioning that the *lanestris* were in a cage three or four times as large as that in which the *neustria* pupated, so, perhaps, there was less likelihood of joint cocoons.—E. Mannering; 46, Wickham Road, Beckenham, August 25th, 1906.

Acidalia immorata.—After a failure to get larvæ of this species through last winter, I have succeeded in breeding a second generation from ova laid by some females caught by me in the locality near Lewes on June 30th last. The ova were laid on July 1st and 2nd, and I got about forty in all. They hatched on July 17th and 18th, and were at once placed on leaves of *Plantago lanceolata*, and as soon as they were large enough were transferred to a potted plant and kept out of doors. Two of the larvæ at once proceeded to grow at a great pace, and, as they appeared to me large enough to be full-grown, I removed them from the growing plant, and took them indoors on August 26th. They fed for a few days longer, and one spun up on August 28th and the second on September 1st. The first larva spun against the side of a glass pot in which it was kept, making a slight silken cocoon, under a dead leaf, on the surface of the earth covering the bottom of the glass; the second also spun up under a dead leaf on the surface of the earth. The cocoons were both large for the size of the pupa, and, as a matter of fact, would hold at least six pupæ. The first larva pupated on September 2nd, and it produced a female imago on September 14th. The imago from the second pupa has not yet emerged, but will probably do so in a few days. With regard to the larva, it is very small and thread-like at first, and is practically unicolorous light greenish-brown until half grown, when it assumes the full markings of the adult larva. There is very little to add to the description of the larva in Barrett's 'Lepidoptera of the British Isles.' It tapers towards the head, the dorsal lines are continued over the head, the dots on either side of the dorsal lines as in a small brownish cloud; the under surface is putty colour, with traces of wavy lines; the dark brown side line is continued along the sides of the head, and there is a buff stripe below it, in which are the spiracles, which is continued down the claspers. When full grown it is a little over an inch in length. The larva feeds in a somewhat peculiar way, as it does not rest on the leaf on which it is feeding but on a neighbouring leaf or grass-stem. When young it eats pieces from the margin of the neigh-

bouring leaf, and when adult it begins feeding at the tip of the plantain leaf and eats that right down from the point almost to the bottom before proceeding to the next leaf. I have still about thirty larvæ, half grown, which will, I presume, hybernate in the usual way.—FRANCIS C. WOODBRIDGE, Northcroft, Uxbridge, September 14th, 1906.

DICRANURA BIFIDA TWO YEARS IN PUPA.—I have this summer bred two *Dicranura bifida* from larvæ taken near Market Rasen, Lincolnshire, in 1904. Other larvæ taken at the same time emerged as perfect insects in 1905.—G. W. MASON; Barton-on-Humber.

AUTUMNAL EMERGENCE OF LEPIDOPTERA.—The hot summer of 1906 seems to have been favourable to the production of what is known as second broods of Lepidoptera; and the following instances of this have come under my notice:—

Arctia caia, of which species I obtained about a dozen ova in the middle of July. The larvæ from these duly hatched, and from the first evinced their purpose of getting through their metamorphosis in record time. Nine pupated between August 17th and 28th; one or two larvæ died, from injury, in early August, and one continued feeding until September 1st, when it became sickly and subsequently died. Nine moths emerged between September 8th and 12th. All were of average size and of the ordinary form.

Twelve eggs of *Parasemia plantaginis* were received on June 29th, and had been laid by a female in Aberdeenshire a few days previously. The majority of the larvæ from these were lost whilst quite young. Five, however, fed up, and, as regards four of them, pupated, and produced moths on August 30th and 31st—all females. The fifth larva is (September 27th) still feeding.

One male example of *Cerura bifida* emerged on August 21st. This was from one of five pupæ resulting from a few eggs obtained on June 29th.

A number of larvæ of *Spilosoma lubricipeda* were fed from the egg on sallow, and many of these had pupated by August 30th, on which day a female specimen emerged. Other larvæ of the same brood continued feeding until about the middle of September. So far no more moths have appeared.

Perhaps the most remarkable instance is that communicated by Mr. L. W. Newman, of Bexley, who sent me a specimen of *Moma orion* that emerged on September 2nd, and had only been in the pupal stage about seventeen days. He also reported on September 5th, that among other things *Cerura bifida*, *C. furcula*, and *Hemerophila abruptaria* "have all been emerging, two or three each, out doors in the sleeves." The weather has evidently also had a retarding influence on some species that more or less regularly attain the winged state twice in the year. In this connection Mr. Newman mentions *Drepana cultraria*, the larvæ of which pupated in June, but only one moth had emerged on September 5th.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

CAPTURES AND FIELD REPORTS.

Deilephila (Phryxus) livornica in Dorset.—On September 10th last I captured a very fine fresh specimen of *D. livornica*, flying over petunias, in the public gardens at Weymouth. This is, surely, a very late date for this insect?—R. A. Jackson, R.N.; Charity Farm, near Hollingbourne, Maidstone, September 23rd, 1906.

Deilephila livornica in Hampshire.—On September 2nd I was given a specimen of *D. livornica*, in perfect condition, by a friend, who caught it on a garden wall near Milton, Hants.—R. B. Murray; Oak House, Brockenhurst, Hants.

Deilephila livornica and Laphygma exigua in Somersetshire.—I note, in the 'Entomologist' for this month that *D. livornica* has been taken at Compton Martin, near Bristol, August 6th. I took a specimen in good condition hovering over verbenas on September 5th here; I had seen one the evening before at the same spot. *Laphygma exigua* came to light July 29th, August 6th, and August 11th, the first two good specimens, the last much rubbed.—Herbert C. Swayne; Ynyswytryn, Glastonbury, September 18th.

Deilephila livornica in Sussex.—On the 12th inst. I had brought to me a living specimen of *D. livornica*. It was in perfect condition, and had been taken in a florist's garden in this neighbourhood. I have never heard of it being taken in this district before.—C. Hamlin; Forest Cottage, Balcombe, Sussex, September 17th, 1906.

Laphygma exigua and Heliothis peltigera in Isle of Wight.—I spent some weeks in the Isle of Wight this autumn, and was fortunate enough to secure a few *L. exigua* and *H. peltigera* in a locality not far from Freshwater.—James Douglas; Dunolly, Sherborne, Dorset, September 20th, 1906.

I may, perhaps, mention that I have just bred a specimen of *H. peltigera* from larvæ taken at Sandown in July last, and that I took a few *L. exigua* at sugar at Shanklin on the 10th inst.—T. Maddison; South Bailey, Durham, September 19th, 1906.

Laphygma exigua, &c., in the Isle of Wight.—I was staying at Freshwater September 8th to 14th, and sugared regularly each evening. A few examples of *L. exigua* appeared on most nights, the earliest was taken at 7.10 p.m., and the latest at 11.40; about 9 o'clock seemed to be the best time for this species. *Aporophyla australis* and *Agrotis obelisca* were fairly common. Two specimens of *Heliothis peltigera* were obtained, and on the last night of my stay a grand female of *Leucania vitellina* was secured. *Agrotis segetum* and *A. suffusa* were both in large numbers.—L. W. Newman; Bexley, Kent.

Laphygma exigua in Somersetshire.—You may be interested to hear that I have discovered a locality for *Laphygma exigua* in Somersetshire this year. Up to the present I have succeeded in obtaining fifty-two specimens, and have also a nice batch of larvæ feeding. The

larvæ I have do not answer to the description given in Newman.—G. F. Rawlings; 8, Augusta Place, Bath, September 16th, 1906.

Deilephila livornica in Kent.—Another example of *D. livornica* was taken this morning outside the General Post Office on the window-sill. Condition as good as bred. The one I reported, *ante* p. 211, was of larger size but much wasted.—Sydney Webb; Dover, September 8th, 1906.

Laphygma exigua in Essex.—Last night, September 18th, I had the pleasure of taking a specimen of this rarity at sugar in my garden. I boxed it carelessly, thinking it was *Caradrina cubicularis*, which is coming rather freely to sugar now; but when I came to set it this morning, the orange spots and small size at once told the tale. I am still holding my breath at the thought of how near I was to leaving it alone.—Rev. W. Claxton; Navestock Vicarage, Romford.

Leucania extranea at Tenby.—On the 29th August I took a rather worn specimen of *L. extranea* at Tenby at rest on a twig near to sugared posts.—J. A. Finzi; 53, Hamilton Terrace, N.W., September 5th, 1906.

Heliothis peltigera in Wiltshire.—On Wednesday, 12th inst., I was fortunate enough to capture a very fine specimen of *Heliothis peltigera* on sugar at Clarendon Wood, near here. As I believe this to be the first record of the capture of this insect in Wiltshire, it may be of interest.—W. A. Boyne; Wilts and Dorset Bank, Salisbury, September 14th, 1906.

Colias edusa at Littlehampton.—A specimen of the above was seen on the river bank at Littlehampton on the 5th September.—Philip J. Barraud; Bushey Heath.

Colias edusa at Folkestone.—I saw a specimen of *C. edusa* near the Warren at Folkestone on August 29th last, and took one on the Downs over the town on the 30th.—F. Rogers; 58, Grandison Road, Clapham Common.

Colias edusa in Suffolk.—I noticed a fine male example of this butterfly, apparently freshly emerged, in my garden on August 31st. I have not seen any since.—(Rev.) A. C. Waller.

Colias edusa in Dorsetshire.—Mr. Lucas informs me that this species was seen at Lulworth, end of August last.—Richard South.

Sphinx convolvuli in Suffolk.—A very damaged female was brought to me on September 14th. This is the only instance of its occurrence about here this year that I know of.—(Rev.) A. C. Waller; Waldringfield Rectory, Woodbridge, September 19th, 1906.

Sphinx convolvuli in Surrey.—I have just received a living specimen of *S. convolvuli*, which had been found at rest on a paling at West Clandon, near Guildford, on September 16th last.—Herbert C. Swayne; Ynyswytryn, Glastonbury.

Polygonia c-album in Surrey.—In your book on 'British Butterflies,' in citing the haunts of *P. c-album*, I see that you have not

mentioned Surrey as a county in which it has been taken, so I thought you would be interested to know that one has been captured in that county this year. My mother, Mrs. H. A. Perkins, of Old Bank House, East Grinstead, who is an enthusiastic entomologist, while in Dormans Park, on the borders of Surrey near East Grinstead, caught a splendid specimen of a male of this species on September 11th, 1906. Personally I consider this a good catch, as for over twelve years I have collected, and in that time not once have I seen it on the wing south of London.—ALEC W. PERKINS; 17, Lime Hill Road, Tunbridge Wells, September 13th, 1906.

CUCULLIA GNAPHALII AT LIGHT.—On June 27th last I took a fine specimen of *C. gnaphalii*, Hb., at the electric light over my porch. I should be glad to know of any recent records of this moth.—JOHN COMBER; High Steep, Jarvis Brook, Sussex, September 14th, 1906.

LIMENITIS SIBYLLA IN EPPING FOREST.—On July 22nd last we saw resting on a bush, but failed to take, the only *L. sibylla* ever noticed by us in Epping Forest.—F. W. and H. CAMPION; 33, Maude Terrace, Walthamstow, September 10th, 1906.

DIANTHŒCIA IRREGULARIS, Hufn., = ECHII, Bork., IN NORTH LINCOLNSHIRE.—Mr. A. Reynolds, of Owston Ferry, has recently presented to the Lincoln Museum a bred specimen of this local insect. He states that he took the larva about ten years ago on viper's bugloss (*Echium vulgare*) in the neighbourhood of East Ferry.—G. W. MASON; Barton-on-Humber.

CHRYSOPHANUS PHLÆAS, var.—On the 8th inst. I caught a remarkably beautiful variety of this species, combining both the *eleus* and *schmidtii* forms. The spots are greatly enlarged and much clouded, whilst the ground colour is a lovely creamy silver.—MARTIN J. HARDING; Church Stretton, Salop, September 19th, 1906.

SIREX JUVENCUS IN NAIRNSHIRE.—A specimen of this hymenopteron was captured on grass at Nairn, on September 15th last, by Mrs. Grant, Drumnadrochit, and sent to me. I find that the last previous capture in the north was at Hopeman, on September 13th, 1899.—HENRY H. BROWN; Cupar-Fife.

NOCTUÆ AT SUGAR IN DAYLIGHT.—During a visit to the New Forest in the early part of July, I one afternoon happened to be passing some trees which had been sugared the previous evening, and on one of the patches was surprised to see a specimen of *Noctua brunnea*. On looking at my watch, I found it was exactly four o'clock; the sun was shining brilliantly, and there was a cloudless sky. One is familiar with the visits of *Catocala sponsa* and *C. promissa* to sugar while it is yet daylight; but I have never come across before a case of such an early appearance as that mentioned above.—(Rev.) J. E. TARBAT; Fareham, Hants.

LAPHYGMA EXIGUA AND AGROTIS AGATHINA IN DORSETSHIRE.—I have pleasure in stating that on the 14th inst. I secured, at Branksome (Dorset), two male specimens of *Laphygma exigua* at light. I also took

a fair number of *Agrotis agathina*. In regard to the latter, it may be well to state that, although a large number of lamps were examined, it was found that only the brightest lights were selected by the insects. They also show a marked partiality for the framework of a lamp, and in one case, where I captured five *agathina* on a single lamp, it was quite impossible to see them until the post had been "swarmed," when the insects were discovered in very awkward corners. I imagine it is a little late for *agathina*, but those I took were certainly in very good condition.—SYDNEY T. THORNE; 162, Ashley Road, Upper Parkstone, Dorset, September 22nd, 1906.

LEPIDOPTERA OF COUNTY CORK.—Among the few good captures this year, the following are of interest:—*Pericallia syringaria*, L. A female emerged on June 25th from a pupa reared from a larva feeding on ash in the garden here. This is the second reliable record for Ireland; the first was taken in Co. Waterford.—*Acronycta alni*, L. A single larva, on August 10th, on an elm-trunk in the lawn; it was unfortunately ichneumoned. It, however, formed a cocoon in dead wood, but died before pupating; I possess the shrivelled-up larval skin. Birchall obtained a specimen in Co. Wicklow, and there is a tradition of its being taken on the walls of Trinity College, Dublin.—*Catocala nupta*, L. A slightly torn imago was secured last night at sugar spread on an elm in front of this house. This is the first certain record for Ireland.—*Dianthœcia barrettii*, Dbl. I find this handsome species widely distributed along the coast of the county. The insects differ considerably from the specimens occurring at Howth. I had an opportunity of comparing mine with a fine series of over thirty, recently procured at the classical locality near Dublin. The Cork specimens are large, of a dark slate colour, with very distinct markings in a light whitish-grey, and no indication of yellow shading.—C. DONOVAN, Major, I.M.S.; Ardmore House, Passage West, Co. Cork, September 17th, 1906.

DEILEPHILA LIVORNICA AND HELIOTHIS PELTIGERA IN IRELAND.—I have read with interest the notes in the 'Entomologist,' for I am able to give a further record of the occurrence of this moth in Hampshire and in Ireland. On each of the evenings of June 2nd, 5th, and 6th, between 8.30 and 9 o'clock, I saw one specimen flying over rhododendron blooms in my garden near Christchurch. Each specimen appeared to be in fine condition, but was too wary to be caught. On June 7th I went to Ireland to spend a month near Cork. In the drive leading to the house where I was staying are many rhododendrons of great height, mixed with large fuchsia trees. On the evening of June 9th, I went out about 8.30 and walked along this drive for about 100 yards. At first there was no moth to be seen, but at 8.45 the rhododendrons were alive with *D. livornica*, and it was a grand sight to watch them at the top flowers of every bush, hovering to and fro in a state of restless activity and, at the least alarm, darting off to a considerable distance. I cannot say how many specimens were seen, but the moth was flying in large numbers. No specimen was taken on this evening, for the lower blooms were but seldom favoured with a visit. From the 10th to the 15th further specimens were seen, but each night

brought fewer, and the last observed was on the 15th. Three specimens only were taken in fair condition. Considering the large number of specimens seen on the 9th, and that the season for this species was then well advanced, one can conjecture only the numbers which must have been flying in County Cork during the last week in May and the first week in June. The blooms of the fuchsias were not attractive. I have seen it recorded that fuchsia and dock, both of which were growing in profusion, are food plants of the larvæ of this species. Search was made for ova, but none were found. The small number of captures is accounted for by the fact that *D. livornica* is a most restless and suspicious insect. It gives the watcher but one stroke at it with the net, and if it is missed it darts off and does not again return. The instinct of self-preservation is evidently well-developed. The period of flight each night lasted about half-an-hour. At 8.30 there might not be a specimen to be seen, but five or ten minutes later they would suddenly appear in force as on June 9th, and at 9.15 all would have disappeared. Some writers describe *D. livornica* as an immigrant, but why? Many species of birds fly north in the spring to find suitable places in which to breed. Insects, with their limited powers of flight and short span of life, cannot be impelled by the same motives. Nature does not act in a haphazard fashion, and as the food plants must occur plentifully on the Continent, and at the very spots where these moths emerge from the pupa, why should this insect—assuming it not to be an indigenous British species—pay the British Isles the compliment of flying across the sea merely as if on a pleasure trip? *Vanessa cardui* is said to cross the English Channel to the eastern counties with a favourable wind behind it. It is, however, a far longer journey across the Atlantic Ocean to Cork, and it has been observed that, whatever butterflies may do, moths usually prefer to fly against rather than with the wind. Another point against the immigration theory is that those persons who have seen *D. livornica* flying at dusk have observed that the period of flight does not last much more than half-an-hour. Of course no one can tell how this insect spends the rest of its time, and it may be that after supping it flies a few hundred miles purely out of exuberance of spirit.

Another insect taken at Cork was *Heliothis peltigera*—one on the sea-shore, mid-day, flying over kidney vetch, and the other in a high walled-in garden flying at dusk over the flowers of lupin. This insect is also dubbed an immigrant, but its powers of flight are very considerably less than those of *D. livornica*. The specimens taken by Mr. Hooker in Dorset are in much better condition than the two taken in Cork, but his specimens were taken about a fortnight earlier. Mr. Hooker also took a specimen on September 4th in the Isle of Sheppey. The food plants given in 'Larva Collecting and Breeding,' by the Rev. J. Seymour St. John, grow in England. With great deference I submit that some more conclusive evidence is required than has yet been published before *D. livornica* and *H. peltigera* can be described with justice as aliens.—A. Druitt, Willow Lodge, Christchurch, September, 1906.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —*July* 12*th*, 1906.—Mr. R. ADKIN, F.E.S., President, in the chair.—Mr. Bellans, of Bedford Park, was elected a member.—Mr. Goulton exhibited the living larvæ of *Phytometra viridaria* (*ænea*) feeding on *Polygala vulgaris*, and also larvæ of *Cidaria suffumata*.—Mr. Step, ova and larvæ at different instars of *Dicranura vinula*, and a series of photographs of Lepidoptera at rest, the most interesting of which were *Scoparia ambigualis* and *Aplecta nebulosa*.—Mr. Turner, ova, *in situ*, of *Coleophora viminetella* on willow, *C. solitariella* on *Stellaria holostea*, and an imago of *Goniodoma limoniella* bred from *Statice limonium* stems from Southend.—Mr. West (Greenwich), short series of *Cryptocephalus parvulus* and *C. punctiger*, together with several *Balininus cerasorum* from Darenth Wood on July 1st.—Mr. Garrett, living larvæ and pupæ of *Euchloë cardamines*.—Mr. F. B. Carr, a cocoon and pupa of *Sarrothripus undulanus* (*revayana*).

July 26*th*.—The President in the Chair.—Mr. West (Ashtead), a short series of *Plusia moneta* obtained in his garden.—Mr. Moore, a varied series of *Epinephele ianira* from Boulogne.—Mr. Rayward, pupæ of *Polyommatus corydon* and *Thecla rubi*, the former from larvæ reared on horse-shoe vetch, and the latter from ova laid on flower heads of dogwood. He also showed ova of *Lycæna arion* and *Plebius ægon*, and referred to the relatively small size of the former. He further reported that of some thirty larvæ of *P. corydon* taken at Reigate on June 18th, nearly all were attended by ants, *Formica flava*, and gave most interesting details of their interrelations.—Mr F. Noad Clark, a photograph of the ova of *Trochilium crabroniformis*, laid by a female taken by Mr. Edwards at Horsley.—Mr. West and Mr. Ashby, thirteen species of Longicorns taken in the New Forest from May 26th to June 9th, including *Asemum*, *Callidium violaceum* (in numbers), *Anoplodera sexguttata*, *Leiopus nebulosus*, *Clytus mysticus*, *Toxotus meridianus*, &c.—Mr. R. Adkin, the beautiful red form, var. *furuncula*, Hub., of *Miana bicoloria*.—Mr. Noad Clark, beautiful micro-photographs of the ova of four species of Coleophora recently obtained by Mr. Turner, together with an enlargement of the micropyle of each.—Mr. Tonge, a photograph showing the wonderful protective resemblance of the larva of *Catocala nupta*.—Mr. Sich, (1) living specimens showing a case of Müllerian mimicry between the Gelechiid, *Recurvaria* (*Aphanaula*) *nanella*, and a Hemipteron, *Phytocoris tiliæ*, frequenting elm bark; (2) a very aberrant form of a Pygæra bred from Chiselhurst; and (3) the ova of *Lycæna alcon* on a gentian, with a photograph of the same by Mr. Clark.

August 9*th*.—The President in the chair.—Mr. Sich, living examples of the Tineid, *Ochsenheimeria vacculella*, with a short summary of the little that is known of the species.—Mr. West and Mr. Ashby, a further portion of the Coleoptera collected by them in the New Forest, including *Trachys troglodytes*, *Elater sanguinolenta*, *E. lythropterus*, &c.—Mr. Adkin, imagines of *Pygæra pigra* and *P. curtula*, with hybrids for comparison with Mr. Sich's *Pygæra*. Finally

this last was considered to be a beautiful aberration of *P. pigra*.—Mr. Adkin also showed full-fed larvæ of *Acidalia marginepunctata* (*promutata*) from Eastbourne ova. Most were ready to pupate, only about ten would probably hybernate.—Mr. Main, a European Mantis in the pre-imaginal stage, a larva of *Papilio podalirius*, and a female of *Parnassius apollo*, with ova of the same, all from the Rhone Valley.—Mr. Rayward, living larvæ of *Agrophila trabealis* (*sulphuralis*) from Cambridge, and of *Cupido minima* from Horsley.—Mr. Tonge, (1) a living larva of *Phryxus livornica* from Lewes; (2) and a preserved larva from Alberto, Spain; (3) a larva of *Sesia stellatarum* from Dunwich; and (4) a series of photographs of Lepidoptera at rest taken during the Society's Field Meeting at Leith Hill on June 30th, including *Bromolocha fontis* (*crassalis*), *Cucullia umbratica*, *Larentia viridaria*, &c.—Mr. Edwards, var. *cæca* of *Aphantopus hyperanthus*, and a female *Trochilium crabroniformis* from Horsley on July 14th.

August 23rd.—The President in the chair.—Mr. Harrison and Mr. Main, (1) a long bred series of *Moma orion* from ova from a New Forest female; and (2) a bred series of *Phorodesma smaragdaria* from Essex. One of the latter was of a more intense green and without the usual white markings.—Mr. Barnett, (1) a short series of *Anthrocera trifolii*, from Wanbury, mostly with confluent spots, and one with ill-developed scales; and (2) several examples of *Epinephele ianira* showing pale coloration, and one female with an unusually pale band on the fore wing.—Mr. Crow, living larvæ of *Melanthia albicillata*, on bramble.—Mr. Carr, living larvæ of *Acidalia imitaria* from ova, on dandelion.—Mr. Turner, (1) examples of the hemipteron, *Carpocoris* (*Pentatoma*) *fuscispinus* from Morgenbachthal and Lucerne; (2) *Heliothis peltigera* taken at Brockenhurst on June 4th; (3) a series of *Bromolocha fontis* (*crassalis*) from Leith Hill in early July; (4) *Ægeria culiciformis* from Beaconsfield; (5) *Coleophora limoniella* bred from larvæ taken at Fobbing in 1905, together with a spray of *Statice limonium* showing the larval cases; (6) specimens of *Polyommatus escheri*, the small form from Gavarnie, in the Pyrenees, with alpine forms of the same species and of *P. icarus* for comparison; (7) on behalf of Mr. Harrison, specimens of *Melitæa dictynna* from Meiringen, with *M. athalia*? taken at the same place and time; and (8) on behalf of Mr. J. W. Tutt, several species of *Ascalaphus* and *Myrmeleon* from the Alps.—Mr. West and Mr. Ashby, some fifty further species of Coleoptera taken in the New Forest this year, including *Calosoma inquisitor*, *Notiophilus rufipes*, *Pæderus calignatus*, *Philonthus splendens*, *Ips 4-guttata*, *Helodes marginatus*, &c.—Mr. Adkin, a series of *Polyommatus bellargus*, females, from Eastbourne in June, and read notes on the geographical distribution of the blue race of this sex.—Mr. Sich, a bunch of poplar twigs, in the leaves of which were the larvæ of three leaf-miners, *Gypsonoma aceriana*, *Phyllocnistis suffusella*, and *Nepticula trimaculella*, and pointed out the characters of the mines with reference to the various details of the different life-histories of the species.—Mr. Main, (1) a batch of the very beautiful ova of *Satyrus briseis* from Switzerland; and (2) on behalf of Mr. Oldham, a fine bred male example of *Cosmotriche potatoria* with female coloration.—Mr. Rayward, pupæ of *Polyommatus bellargus* from Folkestone larvæ, and

gave a most interesting account of the interrelations of ants and the larvæ of this species. In the discussion, Dr. Chapman said that he was on one occasion easily able to find larvæ of *Rusticus argus* by the groups of ants attendant upon each larva.—Dr. Chapman, (1) *Ophiodes lunaris*; (2) *P. corydon* only 28 mm. in expanse; (3) *Colias edusa* only 37 mm. in expanse; (4) *Pseudophia* (*Ophiodes*) *tirrhœa*, properly of a North African group; (5) *Marasmarcha fauna*, a rare Plume close to *M. phæodactylus*, all from St. Maxime, on the Mediterranean Coast of France.—Hy. J. Turner, *Hon. Rep. Sec.*

City of London Entomological Society.—*September 4th*, 1906.—Dr. T. A. Chapman, Vice-President, in the chair.—Mr. A. Bacot exhibited larvæ of *P. podalirius* in ultimate and penultimate *stadii* from Switzerland; also a normal specimen of *L. quercus* bred from a larva that had been subjected to a pressure of about forty atmospheres for several periods of about one hour.—Dr. T. A. Chapman, *L. bætica* and *L. idas* from N. Spain, the latter having hitherto been recorded only from Sierra Nevada.—Mr. J. A. Clark, *B. fuliginaria* taken in St. Katharine Dock, July, 1906.—Mr. C. P. Pickett, *A. sylvata*, a long and variable series from Bucks, including many lead-coloured forms; also a hermaphrodite *A. prunaria*.—Mr. V. E. Shaw, *N. trepida* bred from New Forest ova.

September 18th.—The President in the chair.—Mr. A. Bacot exhibited larva of *D. nerii* in first stadium, the caudal horn being about half the length of the body.—Rev. C. R. N. Burrows, *A. betularia*, female, intermediate between type and var. *doubledayaria*, *T. fulva* var. *concolor*, *L. exigua* and *M. unangulata*, the latter having white band suffused with brown, all from Macking.—Mr. G. G. C. Hodgson, *A. aglaia* ab., resembling *A. adippe*, owing to marginal band being lightly marked, especially as regards the intramarginal black lines.—Mr. L. W. Newman, *E. autumnaria* bred from wild parents, heavily suffused with dark scales; a series of *L. exigua*, Isle of Wight, 1906; melanic *E. atomaria* from Bury, Lancs, and a long series of *B. notha* that had been three years in pupa.—Mr. L. B. Prout, a *Eupithecia* which he considered referable to *E. satyrata*, beaten from juniper near Dorking, and at first believed to be *E. helveticaria* var. *arceuthata*.—Mr. V. E. Shaw, *P. leucophæa* taken at sugar in East Kent, June, 1906; also *A. grossulariata* abs., from Bexley, with central band on hind wings well defined, but the black marginal spots obsolescent.—Mr. Newman reported that larvæ of *B. repandata* reared on birch had produced a second brood in September, but others fed on hawthorn had made very little progress: also that of about one hundred and twenty pupæ of *D. falcula* sixty emerged in April and the remainder in June.—Rev. C. R. N. Burrrows stated that Rev. G. H. Raynor had bred *C. argiolus*, female, third brood, resembling spring form.—S. J. Bell, *Hon. Sec.*, Pen-y-bryn, Knight's Hill, W. Norwood.

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A NEW MEGARHINUS.

By F. V. Theobald, M.A.

Megarhinus herrickii, n. sp.

Megarhinus portoricensis. Herrick (non Von Roder) (Entom. News (1905), p. 281).

Allied to *M. portoricensis*, Von Roder, but differs in the following respects:—

(i) The last segment of the male palpus much longer than the penultimate, at least twice as long; and (ii) the head iridescent bluish green instead of brown with a shiny white border around the eyes, white scales laterally, and azure blue spots in front; (iii) the hind tarsi are white except a black ring at the distal ends, whilst in *portoricensis* the penultimate tarsal segment only is white save for a small basal dark spot.

Habitat.—Mississippi State, U.S.A.

Observations.—This species is referred to by Professor Glenn Herrick as *portoricensis*, but he points out very obvious and marked differences. This new species has been named after him.

The specimens, he says, were bred from larvæ taken "in the cup-like bottom of a massive iron post supporting one corner of a large water tank. . . . Here we found five large, dark brown, very spiny larvæ, and also remnants of cast pupal skins, conspicuous for their long spines, made especially prominent by the colonies of Vorticellæ clinging to them. . . . We fed the larvæ entirely on *Culex* larvæ and great numbers of the latter were devoured. For example, three *Megarhinus* larvæ in four days ate eighty-three large *Culex* larvæ, besides many small ones just hatched from eggs.

"The larvæ transformed to pupæ on September 28th.

"The pupal stage lasted four days, while that of a third extended over a period of five days. The anal flaps seem to have a characteristic shape, and the edges, for the most part, are beset with short stiff spines." (September 20th, 1906.)

SOME NOTES ON SCANDINAVIAN AND LAPLAND BUTTERFLIES.

By H. Rowland-Brown, M.A., F.E.S.

(PLATES VII. AND VIII.)

(Concluded from p. 227.)

Thus, I am afraid the hopes I had entertained of studying the effect of the twenty-four hours' daylight on Lepidoptera generally came to little or nothing. With regard to butterflies, when the sun was out, I did not observe any before 7.30 or 8 a.m.; after 4 p.m., or even earlier, they disappeared, but whether until next morning remains to be proved, for, as I said before, the sun generally retired about the same time, and did not again show from behind the clouds until close on 11 p.m., or later, during the days that I was within the Arctic Circle on Swedish soil. I noticed that the Geometridæ, as might be expected, would fly continuously, however dull the weather, and whatever the hour. But of true night-flying Noctuas, it is a fact that, until I arrived at Alten, I did not encounter one single specimen; so that I must assume for the study of this particular group also the collector should defer his investigations until considerably later in the year. Still, among the day-fliers, I found the pretty yellow-underwinged *Plusia hochenwarthii*, Hochenw., and another *Plusia* with whitish lower wings, probably *P. parilis*, Hb.

July 17th was spent at Hammerfest, waiting for the little steamer which leaves for Alten at midnight, but, as it rained all day, I had no opportunity for observations. But the butterfly fauna, at all events, of this most northerly and smelly town is extremely limited, and the vegetation barren compared with the eastern end of the fiord, up which, in deluges of rain, I presently proceeded. Entomologically, the 18th was an utter failure, though no rain fell, and I found some very promising collecting-ground close to the pretty church at Bossekop—well-wooded, and with a flora delightful to the eye after the sterile north Norwegian coast-land. *L.* var. *ægidion* was evidently common among the *Vaccinium*, and *L.* var. *cyparissus* also; while I took a single specimen of *Chrysophanus* var. *hypophlœas* (=*americana*, d'Urban) asleep on a flower. A few Geometers were also flitting languidly about—nothing else; the atmosphere warm and oppressive, with an abundance of mosquitoes, but still nothing like the pest they were at Abisko. July 20th, when I made a little expedition to the slopes of Skaaddevarre, was also destined to be a *dies non*, though I had hoped to meet with *Argynnis chariclea* here, as recorded by Staudinger. Meanwhile the sun broke through the clouds on the afternoon of the 19th, and the sky cleared as if by magic, with the result that such

H. R.-B.

NORTH-WEST END OF THE TORNEÅTRÄSKE, SWEDISH LAPLAND.

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H. R.-B.

SOME SPECIES OF THE PALÆARCTIC GENUS *COLIAS*.

1. *Colias phicomone*, ♂. (Cauterets, C. Pyrenees).
2. *Colias phicomone*, ♀. (Berisal, Switzerland.)
5. *Colias edusa*, ♂ (Middlesex).
6. *Colias edusa*, ♀ (Middlesex).
3. *Colias nastes*, var. *werdandi*, ♂. (Abisko, Swedish Lapland.)
4. *Colias nastes*, var. *werdandi*, ♀. (Abisko, Swedish Lapland.)
7. *Colias hecla*, ♂ (Alten, Finmark).
8. *Colias hecla*, ♀ (Alten, Finmark).

butterflies as were about began to fly in numbers. However, as I was too soon apparently at Abisko, in the mild and favoured valley of the Alten I was too late, and most things, with the exception of *Argynnis pales* var. *lapponica*, which occurred in countless profusion and first-rate condition, was both worn and torn. Striking the river-bank about two miles from Bossekop inland, I had the pleasure of netting *Erebia medusa** var. *polaris*, and on making inquiry at a farmhouse, where I saw signs of a ferry, the very civil proprietor informed me that at a certain place somewhat higher up the stream there were a quantity of butterflies about: and he was good enough also to put his boat at my disposal. No sooner had I set foot on the further bank—or rather on a sandy well-wooded spit close in under the hills—than this piece of welcome news was confirmed. The first insect I captured was *Colias hecla* (= var. *sulitelma*, Auriv.), and it must be very common here a little earlier, for I took specimen after specimen hopelessly rubbed and shredded, but still enough fresh ones to constitute a decent cabinet series. *E.* var. *polaris* was also present in force—hardly ever settling, but flitting restlessly over the sun-warmed stones very close to the ground. But the most attractive plant was evidently a sort of *artemisium* in full aromatic bloom, on which *L. icarus*, *L.* var. *ægidion*, and the inevitable *L.* var. *cyparissus* disputed possession with our northern "Clouded Yellow," and here and there the fine form of *phlœas*, to which I have alluded. A splendid "tiger" was also much in evidence, to be presently identified as *Parasemia plantaginis*, while the air was musical with the harp-strings of a thousand active Diptera. Such a halcyon day I look back upon with the more pleasure as contrasted with the entire week of cloud and mist which attended me on the return journey right down to Molde. As the boat did not leave Alten until close on midnight on the 21st, I put in another morning at this favoured spot, and was vouchsafed at least two hours of sun, during which, if I took nothing new, I added considerably to my store of the two prevailing butterflies of the locality. But of the other arctic species to be found hereabouts I saw nothing, it being a considerable surprise in this apparently forward season not to encounter *Colias palæno* var.

* I took this butterfly also in Bossekop village. As to its identity, there seems to be some doubt. The question is whether it be a good species, or merely the boreal form of *medusa*, F. Mant. Mr. H. J. Elwes, in his "Revision of the Genus *Erebia*" (Trans. Ent. Soc. 1898, p. 176), suggests that it may be a true species—"var. vel bona sp.? *polaris*, Stgr. Cat. p. 10 (186)"—"subtus subfasciata, trans. ad var. *uralensem*." Dr. T. A. Chapman, exhibiting a series from same locality (Proc. Ent. Soc. 1898, p. xlii), reports, "Some approaching typical *medusa*, and only a few near *polaris* as described, which is therefore an aberration rather than a constant variety. The whole series, however, with a different facies from that of an equal series of Central-European specimens"—which seems further to support the view adopted also by Herr Schneider, that the *polaris* of the north is sufficiently far from the type as to be reckoned a good species.

lapponica, which I missed in Sweden also. As an index of what other collectors may look for, I fear, therefore, that my list necessarily remains very incomplete, and under the circum-

RHOPALOCERA.	Saltdalen, 66° 30′—67°.	Tromsö and Maselvdalen, 69°—69° 40′.	Alten, 70°.	Sydvaranger, 69°—70°.
Papilio machaon	—	+	+	+
Pieris brassicæ	+	+	—	+
P. rapæ	—	—	—	+
P. napi var. *bryoniæ**	+	+	+	+
Colias palæno and var. *lapponica*	+	+	+	+
C. werdandi	+	+	—	—
*C. hecla**	+	+	+	—
Thecla rubi	+	—	—	+
Chrysophanus hippothoë	+	+	+	—
C. phlœas var. *americana**	+	+	+	+
P. amphidamas	—	—	—	+
*L. argyrognomon** (=var. *ægidion*)	+	+	+	+
L. optilete var. *cyparissus**	+	+	+	+
L. aquilo	+	+	—	—
L. astrarche	+	+	—	—
*L. icarus**	+	+	+	—
L. minima	+	—	—	—
Vanessa urticæ and var. *polaris*	+	+	+	+
V. antiopa	+	+	—	+
V. cardui	+	—	—	+
Melitæa parthenie	—	—	—	+
M. iduna	—	—	—	+
Argynnis aphirape and var. *ossianus*	—	+	+	+
A. selene and var. *hela*	+	+	+	+
A. euphrosyne and var. *fingal*	+	+	+	+
A. pales and var. *arsilache**	+	+	+	+
A. chariclea	—	—	+	—
A. polaris	—	+	—	+
A. freya	+	+	+	+
A. frigga	—	+	+	+
A. thore	+	+	+	—
A. ino (Nordvaranger)				
A. aglaia	+	—	—	+
*Erebia polaris**	—	—	+	—
E. lappona	+	+	+	+
*E. ligea**	+	+	+	—
E. embla	—	—	—	+
E. disa	+	—	+	+
Œneis norna	+	+	+	+
Œ. bore	—	—	—	+
Pararge mæra	+	—	—	—
Cœnonympha tiphon	—	—	+	—
Syrichthus andromedæ	+	+	—	—
S. centaureæ	—	—	+	+
*Hesperia comma**	—	—	+	—
Carterocephalus silvius	+	—	—	—

stances, so far as Northern Norway is concerned, I take the liberty to reproduce for the British collector the interesting catalogue of butterflies, forty-six species in all, compiled by

Herr J. Sparre-Schneider,* which in a separate form may not be easily available. The localities, it will be seen, range from latitude 66° 30′ to 70°, and include the famous Sydvaranger, to reach which the traveller must proceed round the North Cape to Vadso.

Those with an asterisk I myself met with at Alten.

In conclusion, I may add that the immediate neighbourhood of Bergen, for butterflies, is unproductive; though all British observers I have met this year agree that the season in Norway generally has been peculiarly poor in butterflies. I spent most of the 27th at the very pretty suburban resort of Fjösanger, but, though well-wooded and with heathy tracts, covered with bracken and heather now coming into bloom, I saw nothing beside the commonest wayside butterflies—a scarcity already noted by me thirteen years ago, when in the whole course of a wet August (1893) I only met with three species of butterflies, two of them—*Erebia ligea* and *Lycæna argus* (= *ægon*, Bergstr.), near the same locality.

I append the following notes on the principal Arctic species collected:—

Pieris napi.—The males taken at Abisko are large and strongly marked on the under side. The females are fine examples of the var. *bryoniæ*, with a deep tawny-primrose wash on the upper side of the wings. Most examples met with were worn more or less, this being the case especially with the females.

Colias nastes, var. *werdandi*.—Seven at Abisko only, where it must have been plentiful, and an early arrival. The females on the wing bear a striking resemblance to those of *C. phicomone* of the Swiss Alps, but the discoidal spots on the upper wings are elongated, and seldom approach the roundness common to the spots on those of Central European and Pyrenean forms. Staudinger retains this as a var. of the Greenland *nastes*; Lampa and the Swedish entomologists, following Zetterstedt, maintain it as a separate species.

C. hecla (=var. *sulitelma*, Auriv.).—The same relationship suggests itself with *edusa*, but with a similar reduction of the upper wing-spots, which in some specimens are actually ocellated. The spots also differ in intensity until I find one very small male in which they have disappeared altogether; while, further, the distinguishing features of *C. boothii*, Curtis, of which *hecla* was supposed to be a variety—the narrow unveined border and greenish tint of the wings generally—are noticeable. Lampa describes an ab. of the female, which he calls *sandahli*, apparently answering somewhat to this male, of which the colour inclines to pale ochre-gold, with the yellow spots between the third and fourth nervure wanting; perhaps this male from Alten is the correlative of this form.

Lycæna optilete, var. *cyparissus*.—Comparing Lapland and Alten specimens with those in my collection from the Central Alps, I find

* (Extract from Tromsö Museum Yearbook 15, 1893; Sydvarangers Lepidoptera (*ib.* 18), Tillæg til Tromsö Lepidopt. (*ib.* 23).

no practical difference. Some of the latter are quite as small as the Abisko forms, and the markings and coloration of the under side is equally pale; while some Arctic specimens are as large as the largest *optilete* from Brenner and elsewhere in that region.

L. icarus.—The males from both localities vary not at all from the ordinary British type on the upper side, or the under side. The females, in addition to those mentioned as ab. *cærulea* from Abisko, are much suffused with blue. In the Alten specimens this tendency is less pronounced; but one shows an almost black ground colour, the blue shining lustrously over it, as in the females of *ægidion*.

L., var. *ægidion.*—All the Abisko females shot with bright blue, and resembling those of the type (= *callarga*, Stgr.). Alten forms, as with preceding species, less brilliant.

Argynnis aphirape, var. *ossianus* (?).—I am in some doubt whether this form from Abisko should not properly be referred to the type.

A. euphrosyne. — This, from Abisko, is certainly typical, and I did not come across the var. *fingal* there. Rather smaller than British form.

A. thore var. *borealis.*—So much lighter, and more distinctly marked, in both sexes than the type from Central Europe, that it presents superficially the appearance of a distinct species.

A. pales.—I have two short series from Abisko and Alten, respectively. Of the former, some of the males are clearly referable to Staudinger's var. *lapponica*—a connecting-link between the type and var. *arsilache*; but, as Sparre-Schneider remarks, this butterfly in the north does not vary nearly as much as in the Swiss Alps. My observations there further bear out his statement, that *pales* is monomorphic in these regions; that is to say, it does not present the familiar *napæa* form of the female. The Alten specimens, as a whole, I refer to the var. *arsilache.* They are much more variable; the females very large and splendidly marked on the under side, fore and hind wings alike. Schneider mentions that the tendency to melanism is rare; but I took one beautiful male (thought at the time to be *A. chariclea*), in which the inner marginal band of upper and lower wings is much suffused on the upper side, while the under side is also more sombrely coloured than usual. The females are remarkably fine, one of them measuring as much as two and a half inches across the expanded wings. (Specimens from Bydalen also strongly marked throughout, the males large and brilliant.) As to the separation of *pales* and *arsilache*, as good species respectively, these northern examples suggest much the same divergence as those from the Alps. There is a distinct mountain and bog development. Surroundings and, according to Schneider, different food-plants seem to have given rise to forms, or species-in-the-making, at least as well pronounced as, say, *Parnassius apollo* and *P. delius.*

A. freija appeared to be rare at Abisko, but probably not out at the time I was there. Two specimens only.

Erebia medusa (? var. *polaris*).—Seen at Alten only. Males with none, or at most a single ocellation on upper side of fore wings. Females extremely variable in size, and extent of rusty blotches and eye-spots.

E. lappona.—Broad rusty blotches of a lively brown, and very

pronounced spots in them on the upper wings. Abisko specimens altogether brighter than Swiss and Pyrenean.

E. ligea, var. *adyte*.—I follow Lampa in classing my series from Abisko as this form; but save that they are smaller than the type, I see little superficial difference.

Augiades comma, var. *catena*.—Common, but much worn, at Abisko. From the brighter green of the under side, no doubt referable to this variety.

The Geometridæ which I brought home have been most kindly identified for me by Mr. L. B. Prout, and are reported by him as follows:—From Abisko: *Acidalia fumata*, *Larentia truncata*, *L. munitata*, *L. hastata* var. *subhastata* (very common), *Zanclognatha* sp. ?, and a Pyralid sp. ?. From Alten: *Larentia munitata*, *L. cæsiata*, *L. montanata* var. *lapponica*, *L. hastata* var. *subhastata*, *L. albulata*, *L. incursata*, and *Pygmæna fusca*.

Oxhey Grove, Harrow-Weald.

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE HEMIPTERA.—No. 6.

By G. W. Kirkaldy.

(A.)

My kind friend Mr. Prout has been so good as to send me brief notes on Gistel's 'Naturgeschichte der Thierreiche' (1848), a work scarcely dealt with as yet in hemipterous literature. Mr. Prout tells me that, owing to Gistel's peculiar views on nomenclature, it is impossible for one who is not a specialist in Hemiptera to be certain of indicating accurately the hemipterous contents of the work. The following few notes, however, will be of interest to workers in this order, and it is to be hoped that the hemipterous portion will be made fully known very soon.

The Hemiptera are discussed on pp. 148–51 and in the Preface:—

(1). || *Platycoris*, Gistel, p. 149 = *Pyrrhocoris*, Fallen, 1814, type *apterus*.

(2). *Eupheno*, Gistel, *l. c.* = || *Macrophthalmus*, Laporte, 1832; =|| *Macrops*, Burm. 1835 = *Caridomma*, Bergroth, 1894; = *Sorglana*, Kirkaldy, 1900.

(3). *Cheilocace*, Gistel, p. 150, type *reginæ-noctis*. Genus not valid, as it is not described apart from the species.

(4). *Mylpha*, Gistel, *l. c.*, n. n. for "*Pœciloptera*," the reason apparently not being stated.

(5). *Cyphoma*, Gistel, p. 151 = *Dorthesia*. The latter is altered because it is a personal name!

(6). *Estphonia*, Gistel, p. viii = *Acroœra* (!), Spin. I presume Gistel means *Arocera*, which is apparently not preoccupied or otherwise invalid.

(7). *Thops*, Gistel, p. x = *Micropus*, Spin. The latter is not preoccupied in zoology, and is moreover a synonym of *Ischnodemus*.

(8). *Hoplomus*, Gistel, *l. c.* = *Oplomus*, Spin.

(9). *Amyctus*, Gistel, *l. c.* = || *Pachymerus*, Lep. Serv. 1825 (= *Pamera*, Say, 1832).

Among new species or specific names are :—

(1). *Nepa ingenicula*, p. 149.
(2). *Naucoris brasiliensis*, l. c.
(3). *N. plana*, l. c.
(4). "*Cercopis harrisii*, Gistel = *furcata*" [!], p. 150.

(B.)

The following new names are necessary in the Fulgoroidea :—

Kirbyella (Eutropistidæ) = || *Kirbya*, Melichar, 1903.

Synaphana (Fulgoridæ) = *Penthicus*, Stål, 1870, O. V. A. F., xxvii. 742 (nec Blanchard), type *variegata* (Guér.), and subgen. *Ereosoma* (= *Aphana*, Stål, *op. c.*, 741 (nec Burm.), type *astræa*, (Stål).

Guérin founded *Aphæna* in 1833 with *discolor*, *variegata*, and *nigromaculata* (*rosea* excluded because compared with *discolor*). In 1835 Burmeister referred to the first two only, and in 1839 Spinola cited *discolor* as the type. The selection of *variegata* as the type by Stål and others is therefore incorrect.

Aphrodisias (Fulgoridæ) = || *Compsoptera*, Stål, 1869, Berlin Ent. Zeit. xiii. 236, type *cacica* (Stål). This fine species has been omitted from the 'Biologia Centrali-Americana.' It was recorded from Mexico. *Compsoptera* is preoccupied by Blanchard, 1845 (Lep.), a name not in Scudder or Waterhouse.

Varcilla (Ricaniinæ) = *Varcia*, Melichar (nec Stål), type *nigrovittata* (Stål).

[*Varcia*, Stål, 1870 = *Aphanophrys*, Melichar, 1898, type *hilaris* (Stål).]

Brachyceps (Issidæ) = || *Brachycephalus*, Signoret, 1866, type *lucida* (Sign.).

(C.)

The following Fulgoridæ have been omitted by Distant and Fowler from their homopterous contribution to the 'Biologia Centrali-Americana' :—

(1). *Philatis productus* (Amphiscepini), Stål, 1862. I have not Stål's description of *Mycterodus productus*; but it is probable that *Batusa*, Melichar, is a synonym of *Philatis*, Stål.

(2). *Aphrodisias cacica* (see above).

(D.)

Copidocephala (Fulgoridæ), Stål, 1869 = *Coanaco*, Distant, 1887 (same type).

Prolepta (Fulgoridæ), Walker, 1851 = *Cynthila*, Stål, 1863, type, *apicalis* (Westwood).

Opinus, Lap. 1832 = *Tapeinus*, Lap. 1832 = *Sminthocoris*, Distant, 1904, Faun. Ind. Rh. ii. 275 and 279. As *O. pictus* is the type of *Opinus*, a not preoccupied name, I do not know why Mr. Distant has added to the synonymy of this Reduviid genus.

Laccifer (Coccidæ), Oken, 1815, Lehrb. Nat. i. 430 = *Tachardia*, Blanchard, 1886, type *lacca* (Kerr), Oken.

ON SOME NEW GENERA AND SPECIES OF INDIAN ICHNEUMONIDÆ.

By P. Cameron.

(Concluded from p. 230.)

OPHIONINÆ.

Limnerium himalayense, sp. nov.

Black; the four anterior coxæ except at the apex, the posterior and the hinder trochanters, black; the apex of the posterior tibiæ and the hind tarsi of a less deep black colour; the apices of the four anterior coxæ, their trochanters, the mandibles, except the teeth, palpi and tegulæ, yellow; the rest of the legs red; wings hyaline, the stigma fuscous, the nervures darker coloured; the areolet oblique, distinctly appendiculated; the recurrent nervure received shortly beyond the middle; the space between it and the second transverse cubital nervure as long as the pedicle. Metanotum with only faint indications of keels at the base, there being no areæ. ♀. Length, nearly 5 mm.

Simla. August (Nurse).

Opaque, granular, sparsely covered with white pubescence, which is longer and denser on the metathorax; the sculpture is stronger on the metanotum, the apical slope is obscurely transversely striated; there is an obscure, oblique, irregularly punctured furrow below the middle of the mesopleuræ. Antennæ densely covered with stiff microscopic pubescence. Tibiæ distinctly spinose, clearly narrowed at the base. Spurs white.

Comes close to *L. erythropus*, described here; it may be known by the appendiculated areolet, by the greater part of the four anterior coxæ being black, and by the black hinder tarsi and apex of tibiæ, the hinder trochanters also being black, not red. The ovipositor is short, about half a millimetre.

Limnerium erythropus, sp. nov.

Black; the legs, except the hind coxæ, which are black, and the four anterior trochanters, which are yellow; the hind tarsi are infuscated; the mandibles, palpi and tegulæ yellow; wings hyaline, the nervures and stigma black; the areolet 4-angled; the nervures

meeting in front, the recurrent nervure is received shortly beyond the middle. ♀. Length, 5 mm.; ovipositor, ½ mm.

Simla. August (Nurse).

Petiolar area longer than wide, of equal width, not very distinct; the lateral areæ large, semicircular; the other areæ are obsolete. Lower two-thirds of the propleuræ at the apex stoutly striated. Median segment more strongly rugosely punctured than the rest; the spiracular area slightly striated.

Neobosmina pilosella, sp. nov.

Black; the head and thorax densely covered with long silvery pubescence; the mandibles, except at apex, palpi and tegulæ, whitish yellow; the anterior legs testaceous, the femora more rufous in tint, the coxæ black; the hind legs black; the tibiæ broadly in the middle below dark reddish; the calcaria dark testaceous, the stigma and nervures black; the apical four abdominal segments laterally and the apices of the third and fourth broadly above and of the fifth narrowly ferruginous. ♂. Length, 8 mm.

Simla. August (Nurse).

Antennal scape testaceous below; the flagellum densely covered with short stiff black pubescence. Head opaque, closely, finely punctured, the centre of front finely, closely, irregularly striated. The eyes have a greenish violaceous tint. Thorax closely, regularly punctured, the punctures distinct and clearly separated; the metathorax more strongly punctured; the areola smooth at the base, the rest closely, finely, irregularly, transversely striated-reticulated; the apical slope is more strongly transversely striated, the striæ more distinct on the posterior median area; the spiracular area more finely, irregularly, closely, obliquely striated beyond the spiracles. Petiolar area with a stout keel; it is longer than wide, rounded, not much narrowed at the apex; the areola is fully twice longer than wide, transverse at the base and apex, of almost equal width at top and bottom; it becomes gradually, but not much, widened to near the middle, then more distinctly narrowed to the apex; the basal keels are stronger than the apical.

The coloration of the legs probably varies as regards the amount of black. The middle legs are darker coloured than the anterior. I unfortunately only know the male. The species may be separated from *N. mandibularis*, Cam. (which is also found in Simla), thus:—

Petiolar area triangular, narrowed to a point at the apex; the areola narrowed to a point at the base; the hind legs with the apical half of the femora and the tibiæ, except narrowly at the apex, red .	*mandibularis.*
Petiolar area wide at the apex; the areola not narrowed to a point at the base; the hind femora entirely and the tibiæ, except broadly in the middle below, black	*pilosella.*

PIMPLINÆ.

BATHYMERIS, gen. nov.

Face of equal width. Mandibles of unequal length. Clypeus bordered laterally by a deep triangular furrow, and by a narrower one above. Temples short, sharply dilated behind. Median segment long, of equal width, closely reticulated. Wings without an areolet. Transverse median nervure interstitial. Transverse median nervure in hind wings broken largely above the middle. First abdominal segment long, at the base half the width of the apex; the second segment longer than wide, the third square, the others wider than long; the abdomen is long, narrower than the thorax, tapering towards the apex. Legs long, slender. Mandibles edentate, bluntly rounded at the apex. The clypeus is broadly impressed at the base. The antennæ are of moderate length; the apical joints slightly serrate, broader than long. There are no transverse or oblique depressions on the abdominal segments.

Comes close to *Xorides*, which may be known by the face being distinctly narrowed in front and by the mandibles being of equal length.

Bathymeris longipes, sp. nov.

Black; the face, a line, roundly curved below, on the lower part of the propleuræ, tegulæ, the large tubercles, a long curved line, narrowed below, under the hind wings, the base of the first abdominal segment and the apices of the others more narrowly, yellow; the four front legs pale yellow, the hind femora reddish fulvous, the rest yellow; with the apical two-thirds of the coxæ, apical joint of trochanters, a mark of the same length on the apices of the femora and tibiæ and the apical joint of the tarsi, black. Wings hyaline, the nervures and stigma black. ♀. Length, 17 mm.; terebra, 9 mm.

Sikkim (Bingham).

Head smooth, bare, except the cheeks, which are covered with white pubescence. Mesonotum closely, finely punctured, the furrows and the apical depression closely striated; the scutellums are much more coarsely punctured; the median segment closely reticulated, more finely on the sides than on the back. Pro- and mesopleuræ smooth, striated, finely below and round the tubercles. Basal three segments of the abdomen closely, finely punctured except at the apex; the third less strongly than the others. Flagellum of antennæ covered with a microscopic pile; the first joint is distinctly shorter than the second. The hind coxæ are about four times longer than wide and reach to the middle of the second abdominal segment. The clypeus is broadly dilated round the edges with a broad depression above. Ocelli in a triangle placed in front of the hinder edge of the eyes; the hinder separated from each other by about the same distance as they are from the eyes.

CRYPTINÆ.

Rothneyia fortispina, sp. nov.

Black; the four front legs rufo-testaceous, the hind coxæ, trochanters and basal three-fourths of femora of a more reddish testa-

ceous colour; the apex of femora, tibiæ and tarsi black; flagellum of antennæ dark testaceous; the wings hyaline; the nervures and stigma black. ♂. Length, 7 mm.

Haundraw Valley, Middle Tenasserim. August (C. T. Bingham).

Antennæ stout, slightly longer than the body, 26-jointed, tapering towards the apex; the scape below densely covered with long white pubescence; the flagellum densely with a short stiff fuscous pile; the third joint a little shorter than the fourth. Face closely, distinctly punctured; the clypeus distinctly, but more widely punctured; they are, as are also the cheeks, densely covered with longish white pubescence. Mesonotum closely, somewhat strongly punctured, densely covered with white pubescence; the apex smooth. Scutellum depressed, rugosely reticulated above; the apex roundly incised, largely projecting over the post-scutellum; the lower part bordered, and with a stout keel down the middle. Base of metanotum with three areæ, the central narrow, of equal width; the large lateral obliquely narrowed from the outer to the inner side; the tooth-bearing part depressed, margined and bearing a few irregular longitudinal striæ; the narrowed apex closely, transversely rugose; the apical slope transversely, closely reticulated. Propleuræ finely punctured; the centre below stoutly striated; there is a broad punctured band round the top and base of the mesopleuræ, the rest smooth and shining; the mesosternum is more strongly punctured. Metapleuræ at the base above closely, somewhat rugosely punctured, the rest closely, strongly reticulated. First abdominal segment rugosely punctured in the middle, the sides stoutly, irregularly, longitudinally striated; the second is strongly, longitudinally, rugosely punctured; the third more finely; its apex roundly incised.

There are two known species of *Rothneyia*, both described from females. When describing the genus (Manchr. Mem. xli. (1897), No. 4, p. 19) I suggested that it should form the type of a new tribe—Rothneyini. I am still of that opinion. An examination of the species here described, as well as of my genus *Acanthoprymnus*, enables me to correctly locate the genus. It will form a tribe of the Cryptinæ, near Phygadeuonini. In the species here described there are clear indications of parapsidal furrows at the base of the mesonotum, and there is a still more distinct, deep mesosternal furrow. The areolated metanotum is also not unlike what we find in that tribe; on it the spiracles are roundish. The transverse median nervure is received shortly behind the transverse basal; the disco-cubital nervure is unbroken; the areolet has the apical nervure distinct but bullated; the discoidal cellule is closed at the apex; the transverse median nervure in hind wings is broken below the middle. Clypeus not separated from the face; its apex broadly rounded. Mandibles broad, bidentate. In the male, of the three dorsal abdominal segments, the third (apical) is the largest; in the male there are seven ventral segments.

ON THE NOMENCLATURE OF THE GENERA OF THE HEMIPTERA.

By G. W. Kirkaldy.

(Part I. 1758–1843, concluded from vol. xxxvi. p. 233.)

The alterations necessitated by finding that the date of publication of the hemipterous part of the 'Voyage of the Coquille' was 1838 instead of 1830 (see 'Entomologist,' xxxv. p. 316), are now made, as well as a few others caused by further investigation. To render more complete the generic nomenclature of the Hemiptera as a whole, the genera of the Sternorhynchi are added; so that all the genera of the Hemiptera, from 1758–1843, are, it is believed, now recorded.

(A). Sternorhynchous Genera, 1758–1843.

1758. Linné, (β) *Cossus* (445), *Chermes*, *Aphis* (451).

1762. Geoffroy, 482–513. (δ) *Psylla*, unnecessary substitution for *Chermes*, 1758.

1784. *Bosc, Journ. Phys. xxiv. 171–3. (α) *Orthezia* t. *characias* (=*urticæ*).

1785. *d'Orthez, *op. cit.* xxvi. 207. (δ) *Dorthesia*, unnecessary alteration of *Orthezia*, 1784.

1789. Olivier, Enc. Méth. iv. 24–61. (δ) *Psilla*, 1762.

1796. Latreille, Précis, 93. (β). *Aleyrodes*.

1798. *Latreille, Bull. Soc. Philom. Paris, ii. 113. (α) *Livia* t. *juncorum*.

1801. Lamarck, 298–300. (γ) *Aleyrodes*, 1796, type *chelidonii* (=*proletella*), *Psylla*, 1762 (thus *Chermes*, 1758), t. *ficus*. (δ) *Coccus*, 1758, t. *mexicanus*, invalid; *Aphis*, 1758, t. *ulmi*, invalid.

1802. Latreille, Hist. Nat. Crust. Ins. iii. 264–7. (γ) *Aphis*, 1758, t. *sambuci*.

1803. *Illiger, Illiger's Mag. ii. 282–98. (α) *Diraphia* t. *juncorum*.†

1815. Oken, Lehrb. Nat. i. 430. (α) *Laccifer* t. *lacca*; Leach, Edin. Enc. ix. pt. 1, 126. (α) *Cionops* t. *characias*.‡

1818. *Rafinesque, Amer. Monthly Mag. iii. 16. (β) *Loxerates* [=*Aphis*].

1819. Samouelle, Ent. Useful Comp. 232. (α) *Eriosoma* t. *mali* (=*lanigera*).

1824. *Blot, Mém. Soc. Linn. Calvados, i. 114. (α) *Myzoxyle* t. *lanigera*.§

1825. Latreille, Fam. Nat. (β) *Monophlebe*.

† Homot. *Livia*, 1798.
‡ Homot. *Orthezia*, 1784.
§ Homotypical with *Eriosoma*, 1819.

[1826. Leach and Risso in Risso's Hist. Nat. Eur. Mér. v. 217. (δ) *Doralis* and *Pharalis*, not descr.]

1827. Latreille, Natürl. Fam. Thierr. (Berthold), 426–8. (δ) *Myzoxylon*, 1824; *Monophlebus*, 1825.

1828. *Boitard, Man. Entom. 171. (β) *Kermes*; *Guilding, Feoriep Notiz. xx. 120. (α) *Margarodes* t. *formicarum*;† *Costa, Prosp. Div. Met. Gen. Coccus, 1–8. (β) *Calymmata*, *Diaspis*, *Diaprostecie* (?).

1829. Latreille in Cuv. Règne Anim. v. (δ) *Monophleba*, 1825.

1830. *Blot, Mém. Soc. Agr. Caen, ii. 332–4. (δ) *Myzoxylus*, 1824; *Gray, Spic. Zool. 7. (β) *Ceroplastes*.

1833. *Brandt, Mediz. Zool. ii. 355. (α) *Porphyrophora* [=*Margarodes*, 1828] t. *polonicus*; Bouché, Naturg.-Schädl. Ins. 52. (α) *Aspidiotus* t. *nerii* (=*hederæ*).

1834. *d'Aveilly, Du Myzoxile, 1–35. (δ) *Myzoxile*, 1824; Boyer, Ann. S. E. France, iii. 222–4. (α) *Philloxera* [also *Phylloxera* in the text] t. *quercus*; Westwood, Zool. Journ. v. 452. (γ) *Monophleba* [*-be*], 1825, t. *leachii*.

1835. Burmeister, Handb. (β) *Rhizobius*, *Lecanium*, *Lachnus*, (δ) *Aleurodes*, 1796; Curtis, Brit. Ent. 576. (α) *Cinara* t. *pini* [= *Lachnus*, 1835]. *Costa, Nuov. Osserv. 22. (δ) *Calymmatus*, 1828.

1836 (?). Costa, Faun. Regn. Nap. Cocc. (α) *Dactylopius* t. *coccus* (= *mexicanus*). (β) *Calypticus*. (γ) *Diaspis*, 1828, t. *calyptroides* (=*echinocacti*).

1836. Vallot, C. R. Ac. Dijon, 224. (α) *Adelges* t. *laricis*; Curtis, Brit. Ent. 625. (α) *Livilla* t. *ulicis*.

1837. Heyden, Mus. Senckenb. ii. 287–99. (α) *Paracletus* t. *cimiciformis*, *Vacuna* t. *coccinea*, *Trama* t. *troglodytes*, *Forda* t. *formicaria*.

1838. Haliday, Ann. Nat. Hist. ii. 189–90. (α) *Byrsocrypta* t. *bursaria*, (β) *Atheroides*; *Zetterstedt, Ins. Lapp. 625. (α) *Leptopteryx* t. *nivalis* (=? *punctipennis*).

1838–41. Westwood, Introd. Mod. Class. ii. 434–50. (α) *Pseudococcus* t. *cacti* (=*mexicanus*).‡ (γ) *Lecanium*, 1835, t. *hesperidum*, (δ) *Ceroplastus*, 1830; Westwood, Synopsis, 117–8. (α) *Thelaxes* t. *quercicola* [=*Vacuna*, 1837]; (γ) *Lachnus*, 1835, t. *roboris*; *Atheroides*, 1838, t. *serrulatus*. (δ) *Brysocrypta*, 1838.

1841. Guérin, Rev. Zool. 129-31. (α) *Callipappus* t. *westwoodii*; Hartig, Germar's Zeitschr. Ent. iii. 358–76. (α) *Tetraneura* t. *rugicornis*; *Rhizoterus* t. *vacca* (= *formicaria*).§ (β) *Schizoneura*.

† This is an abstract; Guilding's paper was apparently not published till 1833, *in extenso*.

‡ Homotypical with *Dactylopius*, 1835.

§ Homotypical with *Forda*, 1837.

1843. Gurtis, Gardeners' Chron. 444. (*a*) *Trechocorys* t. *adonidum* (= *longispinus*); Amyot & Serville, 588–676. (*a*) *Cnaphalodes* t. *pini*. (*δ*) *Chermes* (nec Linné) t. *variegatus* (=*roboris*) [=*Kermes*, 1828].

The following notes refer to Part I. (1758–1843), and conclude it :—

(B). Deletions.—Vol. xxxiii.

P. 240. The notes relating to Guérin's descriptions in 'Voyage of the Coquille.'

P. 265. 1829, Latreille, *Gonocerus*, *Syromastes*, *Anisoscelis*, *Nematopus*, and add (*γ*) *Otiocerus*, 1819, t. *coquebertii*; and Fallen, Hem. Svec. 1–186, (*α*) *Clinocoris* t. *lectularius*. Delete note 7.

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P. 176. Note 7; Guérin's entry (1830), and Herrich-Schäffer's entry (1830? recte 1836). From Laporte, Mag. Zool.; *Zosmenus*, *Megymenum*, and footnotes 40 and 66, Stephens's names being invalid.

P. 178. First half of footnote 69.

P. 179. Line 6, *Xylocoris*.

P. 218 Footnote 107, and read "=*Phlæa*, 1825."

P. 219. Line 14, *Oncocephalus squalidus*; line 21, *Otiocerus stollii*; line 31, *Phyllocephala*.

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P. 213. Footnote 1.

P. 213. (Brulle), *Meropachys*.

P. 214. Line 22, *Dinidor amethystina*.

P. 215. 1840 (last line of text), *Oxyrachis*, and (line 8 from bottom) *Phyllomorphus*.

P. 216. 1842, *Tectocoris*.

P. 231. Line 14, *Brachystethus marginatus*.

P. 232. (Line 6 from bottom), *Saccoderes*, and (last line) *Spartocera geniculata*.

(C.) Additions, &c.—Vol. xxxiii.

P. 28. See also p. 238.

P. 263. 1802, Latreille, "(*δ*) *Tettigonia*, 1762"; and for "*irroratus*" read "*irrocatus*."

P. 264. Footnote 12 should be 13, 13 should be 14, and 14 should be 12.

P. 265. Line 1, for "1819–21" read "1822"; *Otiocerus* is therefore a synonym of *Cobax*. 1822, *Pendulinus* is preoccupied in Aves by Vieillot, 1816, *Dasynus* superseding. 1823, *Podicerus* dates from 1806 (? Zool. Anal.). 1825, line 3, *Pachymerus* is preoccupied in Coleoptera, 1805; *Pamera* (1832) and *Aphanus* (1832) were erected to supplant this, and are therefore homotypical. The following synonymy will elucidate :—

1. *Pamera*, Say, 1832 (= || *Pachymerus*, Lep. Serv. 1825 = *Aphanus*, Lap. 1832), type *pedestris* (=*alboacuminatus*).
2. *Orthœa*, Dallas = *Pamera*, auctt.
3. *Calyptonotus* = *Aphanus* of my former notes, type *rolandri*.

P. 265. 1825, line 8, add "*Astemme*."

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P. 176. 1827, add "Latreille, Natürl. Fam. Thierreichs (Berthold), 414–27. (δ). *Heteroscelis*, 1825; *Tessaratoma*, 1825; *Gonocerus*, 1825; *Syromastus*, 1825; *Pachlysd* (! sic), 1825; *Anisoscelis*, 1825; *Nematopus*, 1825; *Stenocephala*, 1825; *Leptocorixa*, 1825; *Pachymera*, 1825; *Heterotoma*, 1825; *Holoptila*, 1825; *Pæcilloptera*, 1796; *Otiocera*, 1822; *Penthima*, 1821." 1831, add Dufour, Ann. Sci. Nat. xxii. 425. (α) *Xylocoris* t. *rufipennis*. 1832, Laporte, Mag. Zool., add (α) *Opinus* t. *pictus* [changed later to *Tapeinus*], *Zosnanus* t. *maculatus* [changed to *Zosmerus* later], *Ratymeris* [later *Platymeris*] t. *biguttata*. (β) *Megymenum*, *Oncomeris*, *Scutiphora*, *Agapophyta*. (γ) *Syromastes* (recte *Syromaste*, 1825) t. *quadratus*. (δ) *Pelegonus*, 1809; *Syromestes*, 1825; *Holiptilus*, 1825; *Macrophtalmus*, 1832.

P. 177. Line 22, to "*hæmorrhoidalis*," add "(= *bipustulatus*)"; line 26, to "*cinereus*" add "(=*laticornis*)."

P. 178. Line 7, *Platycephala* is preoccupied, and is superseded by *Brachyplatys*, 1835.

P. 178. 1832–4, line 2, to "*elegans*" add "=*bilineatus*."

P. 178. 1833, line 6, to "*marginatus*" add "=*saltitans*"; to footnote 73 add "also preoccupied"; line 9, for "15–90" read "159–90."

P. 179. Line 1, add "(α) *Selenocephalus* t. *obsoletus*"; for "*Dictyophara*" read "*Dictyophora*"; line 3, *Lamproptera* is preoccupied.

P. 218. Transfer "Guérin, Ins. Voy. Bélanger," to 1833 (Aug. 31), add (α) *Ugyops* t. *percheronii*; (β) *Aphæna*; and for "*lepeletieri*" read "*lepelletierii*"; line 13, to "*paradoxus*" add "= *corticalis*."

P. 218. For "? 1834 [1832–5]" read "1834."

P. 219. Boisduval, for "60946" read "609–46"; add (γ) *Agapophyta*, 1832, t. *bipunctata*; *Megymenum*, 1832. t. *dentatum*; Hahn (line 7), *Stenogaster* is preoccupied; Burmeister, add (β) *Arilus*, (δ) *Tapinus*, 1832; *Pirates*, 1829; *Copium*, 1822; line 12, *Hynnis* is preoccupied, and is also synonymous with *Cobax* and *Otiocerus*; line 18, *Hypselopus* is preoccupied; line 22, to "*umbilicatus*" add "=*tenebrosus*, Fabr."

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P. 213. Serville, remove *Dysdercus* to (α) and add "t. *decussatus*"; line 5 from bottom, for "*productus*" read "*sardea*."

P. 214. Line 25, for "1834" read "1833." 1837, add Westwood* in Drury, Ill. Exot. Entom. (n. edn.), (*a*) *Diaspidius* t. *scapha*. 1838, add "Guérin, Voy. Coquille, Zool. ii. pt. 2, 165–93." (*a*) *Leptoglossus* t. *dilaticollis*. (β) ‖ *Platycoris*. 1839, line 7, remove "*Phylloscelis*" to (*a*) and add "t. *pallescens*."

P. 215. Last line of 1839, "*Philia* is a synonym of *Calliphara* and *Callidea*."

P. 216. Line 5, for "1838–42" read "1840."

P. 230. Line 14, for "*Piezostemum*" read "*Piezosternum*."

P. 233. Line 5 from bottom, for "*Ugyogs*" read "*Ugyops*."

NOTES AND OBSERVATIONS.

British Setting.—In the excellent little butterfly book of the "Wayside and Woodland" Series recently published, which will no doubt become *the* book for beginners, I was disappointed in one particular, the instructions for setting. The continental setting-board, and the old English "oval" or sloping side setting-boards, are both carefully figured and described, but no mention at all is made of the one that is, I suppose, chiefly used now, *i. e.*, the ordinary English "flat" board, exactly like the "oval," but with flat instead of sloping sides. Why encourage the beginner to waste money on boards that will ultimately have to be got rid of? The continental one is not yet adopted by British collectors, and there is no sense in using it unless wishing to exchange with foreigners. The old "sloping sides" board is absolutely out of date, and few people would say "thank you" for insects offered for exchange that have been set on it. Then, too, a *pair* of setting-bristles should be used (and not one only), and the whole insect "placed" before any braces are put on, otherwise the body is very liable to be drawn to one side, and the insect be crooked. And tracing linen forms the best brace whatever method of setting be used, and if placed on the wings before the cotton is wound round (in Scotch style) prevents the "stripy" appearance caused by the indenting of the cotton.—K. M. Hinchliff; Instow, N. Devon.

CAPTURES AND FIELD REPORTS.

Cymatophora octogesima, &c. in London.—On July 5th I took a freshly emerged specimen of *C. octogesima* at light near here, and a friend of mine, Mr. G. D. Millward, visiting the same spot with me on the 7th, took another, also in perfect condition. This year I have taken several species within the west and south-west districts that I have not seen in London before, such as *Calligenia miniata*, *Gastropacha quercifolia*, and *Dicycla oo* (a female, unfortunately much damaged).—H. G. Place; 11, Norland Square, W., September 2nd, 1906.

Laphygma exigua and Heliothis peltigera at Bournemouth.—On September 21st I took a male specimen of *Heliothis peltigera* while

dusking in my garden. I also took *Laphygma exigua* in my light-trap. The next day I took another male *H. peltigera*.—E. DE GEIJER; Boscombe Manor, Bournemouth.

LAPHYGMA EXIGUA IN KENT.—On September 8th last I took a specimen of *L. exigua*, at rest, in early morning, among the rubbish collected in the corner of the Salem Chapel, Biggin Street, Dover.—F. P. ABBOTT; 8, Beaconsfield Road, Dover.

LAPHYGMA EXIGUA IN HAMPSHIRE.—While staying with my sister at Fernbank, near Milton, I took two specimens of *L. exigua* at light in my bedroom on July 28th.—H. G. PLACE; 11, Norland Square, W.

LAPHYGMA EXIGUA IN OCTOBER AT TORQUAY.—We have taken six examples of *L. exigua* at ivy flowers; one on the 4th, two on the 5th, and three on the 6th of this month. They are in perfect condition, and are better than a lot that were taken in August. *Heliothis peltigera* is still out; a good specimen was taken at ivy by my brother on October 5th. *Plusia gamma* is swarming at the ivy here by thousands; I have never seen so many before.—J. WALKER; 3, Goodwin Terrace, Carlton Road, Torquay, October 8th, 1906.

DEILEPHILA LIVORNICA IN HAMPSHIRE.—On August 31st I took a very fine fresh specimen of *D. livornica*, which came to light in the drawing-room of the house where I was staying, at Headley, Hants, about nine p.m.—K. M. HINCHLIFF; Worlington House, Instow, North Devon.

DEILEPHILA LIVORNICA IN HANTS.—A fine specimen of *D. livornica*, taken in August in a cottage at Whitmoor Bottom, Grayshott, Hants, near this place, by A. Alderton, was brought to me yesterday.—H. T. G. WATKINS; Ridgeways, Hindhead, Haslemere.

NOCTUÆ AT SUGAR IN DAYLIGHT.—I can beat Mr. Tarbat's record. One morning in August last I noticed a specimen of *Miana bicoloria* on a sugared tree at 9 a.m., which was not there when I passed previously at 8 a.m., and was gone again at 10.—(Rev.) W. CLAXTON; Navestock Vicarage, Romford.

NYSSIA LAPPONARIA EMERGING IN SEPTEMBER.—I may mention that I bred a female specimen of *N. lapponaria* in September; I believe that this is a very unusual occurrence.—(Rev.) W. CLAXTON; Navestock Vicarage, Romford.

XYLINA SEMIBRUNNEA IN WILTSHIRE.—On September 27th this year I took, at sugar, a very fine specimen of *X. semibrunnea* about 7.15 p.m.; night was cold and starlight.—J. C. MOULTON; The Hall, Bradford-on-Avon, Wiltshire.

MELANTHIA ALBICILLATA DOUBLE-BROODED.—I find that *M. albicillata* is double-brooded with us this year. I took about two dozen specimens on the night of September 29th.—H. D. KENYON; Lamorna Villas, Mt. Charles, St. Austell.

COLIAS EDUSA IN CORNWALL.—On September 27th I saw a female *C. edusa* flying over the "towans" (sandbanks, links), near Hayle. It was apparently a perfectly fresh specimen. This is the only *C. edusa*

I have seen this year, if, as I believe, one I saw next day in the same place was the same specimen.—HAROLD HODGE; 9, Highbury Place, London, N.

DRAGONFLIES BRED IN 1906.—I have bred this year *Cordulegaster annulatus*, *Æschna grandis*, *Æ. cyanea*, *Cordulia ænea*, *Calopteryx virgo*, *Erythromma naias*, *Pyrrhosoma nymphula*, *Agrion puella*, and *Enallagma cyathigerum*. I have found the nymphs as plentiful this year as last year I found them scarce, collecting in the same localities.—HAROLD HODGE; Highbury Place, London, N.

CIRRHŒDIA XERAMPELINA IN HERTFORDSHIRE. — In early spring I secured, by searching the bark of an old ash-tree, three larvæ which seemed to be those of *C. xerampelina*. I put them in a box with a piece of flannel, which they seemed to welcome in the prevailing cold. When the buds came out I tempted them and found that they ate them greedily. They fed up and changed. A week ago I had the reward in two imagines emerging. I searched at the root of this tree and have found two pupæ.—(Rev.) E. EVERETT; Markyate, near Dunstable, August 29th, 1906.

DEILEPHILA LIVORNICA AND SPHINX CONVOLVULI IN SOUTH WALES.—During the second week in September last my brother captured a specimen of *D. livornica* and eleven examples of *S. convolvuli* at one patch of tobacco in flower. He was also fortunate in obtaining, in the same garden, a specimen of the first-named moth last spring.—LESLIE F. BURT; Broadley, Coedcanias, Begelly, R.S.O., Pembrokeshire.

SPHINX CONVOLVULI AND COLIAS EDUSA IN SUSSEX.—A good female specimen of *S. convolvuli* was brought me on October 1st, which had been caught near here, fluttering over some waste ground. I also beg to report the capture, on the 10th inst., in a garden close here, of a perfect male *C. edusa*.—G. E. H. PESKETT; 4, Clermont Road, Preston, Brighton, October 21st, 1906.

SOME ENTOMOLOGICAL NOTES FROM BARNSTAPLE.—Wasps have this year been quite rare in the district, and I scarcely saw one till the beginning of September. Now (September 13th) they are growing more numerous, and in South Devon I am told they have been common all the summer. A fine specimen of *Sirex gigas* on August 27th, crawling over a felled larch-tree. It was rather sluggish, and I could not induce it to fly. At Santon, on June 5th, I saw and watched for nearly five minutes a perfect specimen of *Deilephila livornica*. It was flying about in the sunlight and pitched on a piece of sandstone rock, where I was able to observe it closely. Several others, I believe, have been taken in the neighbourhood. Among the sandhills near Braunton lighthouse the ladybirds *Coccinella 7-punctata* and *11-punctata* have, this summer, been in immense numbers. I first noticed them at the end of July, when all the herbage was covered with them and their larvæ and pupæ. On several occasions I detected a "seven-spot" larva feeding on another larva of the same species. In each case the grub that was being eaten had a large round hole on the under side of the abdomen, where its cannibalistic brother was gnawing. The "eleven-spot" was the less numerous of the two.

That part of the Burrows is very bare of plants except for marram grass.

In 1902 I took several specimens of *Callimorpha quadripunctaria* (*hera*) in South Devon. They were numerous in the garden of the house where I was staying, and I could have taken many more. They have not occurred there since.

Macroglossa stellatarum was very common this year at Santon. One which was hovering over a thistle allowed me to gently touch it without the least sign of disturbance. I do not know if this is at all unusual. From about August 8th to the beginning of September *Satyrus semele* was very common on Down End, Santon; and at the same spot, and also at Baggy Point, a few miles further along the coast, *Vanessa cardui* has been swarming, but they were all faded specimens. I first observed these on June 4th, and they remained in undiminished numbers till about July 17th. However, all through the summer untarnished specimens have been common everywhere.

On June 17th and June 6th in the years 1905 and 1906 respectively, I took a good supply of a local beetle (though quite common where it occurs), *Pachyta octomaculata*. They frequented *Œnanthe crocata* on the banks of the River Yeo.—Bruce F. Cummings; 14, Cross Street, Barnstaple, North Devonshire.

An Autumn Night's Sugaring at Strensall.—October 9th had been a very warm, muggy day for the time of the year, so I thought I would try sugaring. Just as dusk was coming on a fine drizzling rain started, The wind was a gentle breeze from the south-east, and the atmosphere was oppressive and thundery. I was rather late in getting to my sugaring ground (a row of mixed trees on the edge of an oak wood), and in the hurry of trying to get everything ready on the ground before darkness set in I accidentally poured more than my usual allowance of essence of almonds into the sugar mixture. Whether this fact, or the weather, had most to do with the result I cannot say, but the result was the best sugaring night I have ever had this year. I had about a quart of sugar mixture, and I had accidentally poured half the contents of an essence bottle into it. The moment I had put the mixture on the rain began to fall heavily, and the air was as warm as midsummer. When I started round the sugar patches—about twenty in number and quite small patches—I was astonished at the quantity of moths. The smallest number at any one patch was fifteen, the largest thirty-five, Besides those actually counted sucking the sugar, others were flying up and alighting on different parts of the tree-trunks. The species were:— *Orthosia macilenta*, *O. lota*, *Anchocelis pistacina*, *A. litura*, *Cerastis vaccinii*, *C. spadicea*, *Scopelosoma satellitia*, *Xanthia ferruginea*, *Agriopis aprilina*, *Miselia oxyacanthæ*, and *Calocampa exoleta*, and all of them well distributed. At light that same night I got *Scotosia dubitata*, *Oporabia dilutata*, *Chesias spartiata*, and *Diloba cæruleocephala*. This last is so common just now at Strensall that I got five in as many minutes just by putting a lamp in a window overlooking some fields bounded by hedges of hawthorn and blackthorn. Whether the quantities of moths at the sugar were due to the weather, or to the overpowering smell of the almond essence, I cannot say, as the next night was not

a good sugaring night from an atmospheric point of view, and I did not try again.—B. TULLOCH (Captain, K.O. Yorkshire L.I.).

PYRAMEIS CARDUI IN 1906. — During the late spring and early summer (end of May and first half of June) great numbers of immigrant *P. cardui* arrived on this coast and steadily pursued their way inland, so we expected great quantities this autumn; but so far (October 15th) very few specimens have been seen, nothing to compare with the numbers in other "*cardui*" years. — K. M. HINCHLIFF; Worlington House, Instow, North Devon.

ACHERONTIA ATROPOS IN ROXBURGHSHIRE.—A fine specimen of this moth was taken on the school wall at Newtown St. Boswell's by one of the schoolboys on October 8th, and brought to me by the schoolmaster the same day. Though taken by hand and brought in a wedding-cake box, it was quite fresh and practically perfect.—B. WEDDELL; Selkirk.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, October 3rd*, 1906.—Mr. F. Merrifield, President, in the chair.—Mr. A. Hall, of 16, Park Hill Rise, Croydon, and Mr. E. E. Bentall, of The Towers, Heybridge, Essex, were elected Fellows of the Society.—Commander J. J. Walker exhibited a specimen of *Calosoma sycophanta* taken in Denny Wood, New Forest, June 16th; *Lygæus equestris*, L., found in the Isle of Sheppey on September 22nd; *Sitaris muralis*, taken near Oxford in August by Mr. A. H. Hamm; two varieties of *Vanessa urticæ*, with a strong black ligament connecting the second costal and dorsal spot on the fore wings, from the Isle of Sheppey, August; a variety of *Argynnis adippe*, male, caught at Tubney, Berks, on July 7th; a slate-coloured variety of *Lycæna icarus*, male, taken near Chatham, August 24th; and examples of an almost black form of *Strenia clathrata*, occurring at Streatley, Berks, in August—all taken this year. — Mr. G. T. Porritt showed a series of *Abraxas grossulariata* var. *varleyata*, bred this year from a pairing of the variety obtained from wild larvæ the previous season at Huddersfield. All the brood were of the variety, none showing the least tendency to revert to the ordinary form.—Mr. C. P. Pickett brought for exhibition a gynandromorphous specimen of *Angerona prunaria* bred by him, and a male specimen of *Fidonia atomaria*, caught at Folkestone, with six wings. — Professor Charles Stewart, F.R.S., exhibited a remarkable unnamed exotic larva, found in a collection of specimens received at the College of Surgeons. It displayed a series of iridescent spots about the spiracles.—Mr. W. J. Lucas exhibited, on behalf of Messrs. F. W. and H. Campion, specimens of the rare dragonfly *Sympetrum flaveolum*, taken near Epping in August last, and read an account of their capture, in which it was suggested that these were part of a migration of the species such as occasionally takes place. — Dr. F. A. Dixey exhibited specimens of *Nychitona medusa*, Cram., *Pseudopontia paradoxa*, Feld., *Terias senegalensis*, Boisd., *Leuceronia pharis*, Boisd., and *L. argia*, Fabr., remarking that, although there did not exist, so far as he was aware, any

direct evidence that the members of the genus *Nychitona* are distasteful, their habits are such as to suggest this mode of protection; and there is little doubt that they have served as models for other insects.—Mr. H. J. Donisthorpe exhibited examples of *Dinarda pygmæa*, Wasm., with our other three species, *D. hagensi*, Wasm., *D. dentata*, Gr., and *D. märkeli*, Kies., with their respective hosts, and read a note on their occurrence in this country. He also exhibited a larva of *D. dentata* sent to him by Father Wasmann, and a larva of *D. pygmæa* taken by him in Cornwall.—Dr. Norman Joy showed the following species of Coleoptera first recognized as British in 1906:—*Laccobius sinuatus*, Mots., from Lundy Island and Cambridgeshire, distinguished by its smaller size and more parallel form from *L. nigriceps*, Thoms.; *Homalota paradoxa*, Rey., taken in moles' nests in Berks and Devon; *Quedius vexans*, Epp., and its larva, from moles' nests in Berks; *Euplectus tomlini*, Joy, from a starling's nest at Bradfield, Berks; *Corticaria crenicollis*, Mannh., from under bark at Basildon, Berks, and at Epping; *Cardiophorus erichsoni*, Buyss, taken on Lundy Island. He also exhibited:—A variety of *Lathrobium elongatum*, L., from South Devon, with entirely black elytra, and which he proposed to call var. *nigrum*; a curious dull aberration of *Apteropeda globosa*, Ill.; *Heterothops nigra*, Kr., taken in moles' nests from various parts of the country; a species of *Gnathoncus* differing in certain characters from *G. rotundatus*, Kugel, and which occurs almost exclusively in birds' nests.—Mr. L. B. Prout showed, on behalf of Mr. G. B. Oliver, of Tettenhall, Wolverhampton, a melanic female of *Acidalia marginepunctata*, Goeze, and a melanic male of *A. subsericeata*, Haw., both taken in North Cornwall this summer, together with the typical forms for comparison; also a dark aberration of *Cœnonympha pamphilus*, Linn., taken in the same district in 1903, which, on the whole, is noted for light and brightly-marked forms.—The President, exhibiting a series of *Selenia bilunaria*, drew attention to the curious angulation of the wings in these examples.—Mr. H. W. Southcombe communicated a note on the formation of a new nest by *Lasius niger*, the common black ant.—Mr. W. J. Kaye read "Some Notes on the Dominant Müllerian Group of Butterflies from the Potaro River District of British Guiana."—Mr. G. J. Arrow read "A Contribution to the Classification of the Coleopterous Family Passalidæ."—H. Rowland-Brown, M.A., *Hon. Secretary*.

The South London Entomological and Natural History Society.—*September 13th*.—Mr. H. Main, B.Sc., F.E.S., Vice-President, in the chair.—Mr. Goulton exhibited a long series *of Calymnia trapezina* from the New Forest, the only species met with in several nights' sugaring in August. Many were var. *rufa*, and a few var. *ochrea*. He also showed larvæ of *Craniophora ligustri* from ova.—Mr. Bellamy, series of *Adopæa lineola* from Gravesend.—Messrs. Harrison and Main, long bred series of *Hadena contigua* and *Coremia unidentaria* from the New Forest.—Mr. Barnett (1) very dark bred examples of *Abraxas grossulariata* from Greenwich larvæ, one of which was rayed on the hind wings; (2) very pale, dark suffused, and extremely dark forms of *Hybernia marginaria* from West Wickham.—Mr. Sich, living larvæ of *Pieris daplidice* from Geneva, feeding on mignonette.—Dr. Chapman

(1) a short series of *Lampides telicanus*, bred from eggs and larvæ found in North-West Spain, and discussed the relation between the marbling of the under surface and the usual Lycænid spotting; (2) specimens of *Chrysophanus phlæas*, *Polyommatus bellargus*, *L. bætica*, and *L. telicanus*, in illustration of his further remarks on the spotting. —Messrs. West and Ashby, some seventy species of *Chrysomelidæ* and *Curculionidæ* from the New Forest this year.—Mr. Clark reported numbers of *Catocala nupta*, resting on the walls of Paddington Infirmary, all most conspicuouly situated. Mr. Main had met with numbers near *Cossus*-infected trees.—Mr. J. W. Tutt made some interesting remarks on his trip to the French Alps in August.—Mr. Kaye exhibited very large specimens of *Thecla betulæ*, bred from Huntingdon larvæ, which had been kept close in tin boxes.

September 27th—Mr. Robert Adkin, F.E.S., President, in the chair. —Messrs. Harrison and Main exhibited (1) a long series of *Bisulcia ligustri* bred from larvæ taken at Box Hill; (2) a brood of *Thyatira batis* from New Forest ova; and (3) a series of *Melitæa cinxia* bred from the Isle of Wight, several specimens having the white band of the under side very strongly developed.—Mr. Step, for Mr. Carreras, an extremely remarkable variety of *Polygonia c-album*, from the banks of the River Wye, having the usual dark markings suffused, enlarged, and confused almost beyond recognition.—Mr. Tonge, a further series of photographs of Lepidoptera at rest.—Mr. Carr, larvæ of *Anticlea nigrofasciaria*, ready to hybernate.—Mr. Colthrup, (1) a specimen of *Heliothis peltigera*, taken in August on the south coast; and (2) some nice forms of *Melitæa cinxia* from the Isle of Wight, of which one had the apical area almost devoid of markings, and the remaining markings much reduced.—Mr. West (Greenwich), forty-three specimens of Coleoptera taken at Great Yarmouth in June; collecting was poor, and the only species at all common were Donacias in the Caistor marshes. —Mr. South, (1) a specimen of *Amphidasys betularia*, intermediate between the type and var. *doubledayaria*; (2) *Orobena straminalis*, with very wide blackish borders on the outer margin of all the wings; and (3) *Pyrausta nigrata*, with unusually broad white bands.—Mr. Sich, a specimen of *Heliothis peltigera*, bred from an ovum sent him by Mr. Eustace Bankes, and a drawing of the larva.—Mr. Turner, (1) life-history of *Coleophora obtusella* from the Isle of Wight; (2) specimens of *Goniodoma limoniella* and *G. auroguttella* for comparison; (3) species of *Erebia* taken by Mr. Harrison and himself in Switzerland, *E. lappona*, *E. epiphron*, *E. ligea*, *E. tyndarus*, *E. goante*, and *E. blandina*; and (4) *Enodia hyperanthns*, specimens showing great variation in ground colour of the under sides.—Mr. L. Newman, a very large number of specimens, mainly bred this season, including *Xylomiges conspicillaris*, *Cucullia gnaphalii*, yellow males and melanic *Ematurga atomaria*, selected forms of *Melitæa aurinia*, a yellow *Callimorpha dominula*, an extraordinary suffused dark chocolate *Eugonia autumnaria*, varied *Chrysophanus phlæas*, melanic *Macaria liturata*, *Leucania sparganii*, a very pink *Amorpha populi*, very varied *Mimas tiliæ*, var. *taras* of *Hesperia malvæ*, bred *Brephos notha*, Rannoch forms of *Drepana falcula*, a smoky *Arctia villica*, *Agrotis cursoria*, *A. ripæ*, and *A. præcox* in numbers.—Hy. J. Turner, *Hon. Rep. Sec.*

Lancashire and Cheshire Entomological Society.—The opening meeting of the session was held in the Society's rooms, at the Royal Institution, Colquit Street, Liverpool, on Monday the 15th inst., Mr. Richard Wilding, Vice-President, in the chair.—This being the annual exhibition meeting of the Society, there was a good muster of members from other towns. The number and interest of the exhibits was quite up to the high standard maintained for several years past, and those present had an opportunity of seeing many rare and noteworthy insects. In the order Lepidoptera Mr. F. N. Pierce, F.E.S., showed a case of varieties of *Abraxas grossulariata* from Wallasey, some of the forms being of exceptional interest. Mr. Prince also showed the same species, together with other insects from Wallasey.—Dr. Edwards, two drawers of Lepidoptera from Lancashire and Devon, including among others short series of *Limenitis sibylla*, *Calligenia miniata*, *Epione apiciaria*, *Geometra papilionaria*, and *Cidaria silaceata*.—Mr. B. H. Crabtree, F.E.S., brought a couple of cases containing beautiful bred series of *Odontopera bidentata* ab. *nigra*, from Manchester; *Heliothis peltigera*, from Sidmouth; *Boarmia repandata*, *Agrotis ashworthii*, and *Epunda lichenea* from North Wales, and many other interesting species. —Mr. R. Tait, junr., long series of bred insects, showing variation:—*Agrotis agathina*, *A. ashworthii*, *Boarmia repandata*, and *Cleora lichenaria*, from North Wales; *Thecla quercus*, *T. betulæ*, and *Angerona prunaria*, from Hunts; *Aplecta nebulosa* var. *robsoni*, and a beautiful melanic specimen of *Acronycta alni*, from Delamere, the last taken as a pupa from an alder.—Dr. Bell, of New Brighton, showed cases of life-histories illustrating the early stages of many of our rare as well as common moths, mounted upon their food-plants; also the results of four days' collecting in fenland.—Mr. W. Mansbridge, a series of *Aplecta nebulosa* and its black variety *robsoni*, bred from ova deposited by a wild black female; a long series of *Macaria liturata* and var. *nigrofulvata*, both from Delamere; a series of *Cabera pusaria* var. *rotundaria* from Knowsley, and a series of *Rumia luteolata* from Allerton, showing seasonal variation between the spring and autumn broods. The last member also read a communication to the Society upon the general causes of insect variation. In the Coleoptera section Dr. Corbett, of Doncaster, showed series of various species of beetles from that district, including the very rare *Carpophilus sexpustulatus* recently taken in an isolated locality and undoubtedly indigenous British specimens. —Messrs. J. F. Dutton and George Ellison, interesting varieties of *Cicindela campestris* (the common tiger-beetle), *Agabus nebulosus*, *Cœlambus novemlineatus*, *Otiorhynchus blandus*, and many others, from the Orkney Islands, collected during a visit last summer to that locality. Mr. George Ellison further exhibited two specimens of the Orkney vole, *Microtus orcadensis*, a new British mammal, together with its parasitic fleas *C. penicilliger*, *C. gallinæ*, and *T. agyrtes*, and stated that all of these parasites were well known to occur on the domestic fowl. —H. R. Sweeting and Wm. Mansbridge, *Hon. Secs.*

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NOTES ON REARING *TORTRIX PRONUBANA*, Hüb.

By Robert Adkin, F.E.S.

While at Eastbourne in September last I was strolling one morning at about nine o'clock when I noticed a small bright-looking moth fly across the road, settle for a moment on a gate-post, and then disappear over a garden. Its appearance seemed familiar to me; it was certainly a *Tortrix*, and I came to the conclusion that it was more like a specimen of *T. pronubana* that I had seen exhibited at the Entomological Society some months earlier (Proc. Ent. Soc. 1905, p. lxiii) than any other member of the genus that I could call to mind. The specimen there exhibited was taken at Eastbourne, and the only other known British example was obtained at Bognor (Ent. Mo. Mag. xli. p. 276). If, therefore, my conclusion was a correct one, it appeared probable that these were not merely casual visitors, but that the species was established on our south coast, and only wanted working for to be found.

After a week spent in fruitless search, I chanced one morning upon a euonymus hedge in a private garden, to which I had managed to gain access, and obtained from it, as the result of many hours close searching, seven or eight very ordinary-looking small pupæ, and three or four very evident *Tortrix* larvæ, from which I eventually reared both sexes of *T. pronubana*. The species did not appear to be by any means common, but it has evidently obtained a footing in this country, and having regard to the abundance of what appears to be a suitable food-plant on many parts of our southern coast, there is good reason to hope that it may become firmly established as a British species.

The larva is green, of a shade a little lighter than the young leaves of the euonymus, hairs whitish, and head of a somewhat paler and yellower shade than the body and glabrous. It spins together the terminal developed leaves of the euonymus, and feeds upon the tender shoot enclosed between them.

The pupa is very dark brown, almost black, from 9 mm. to

10 mm. in length, and enclosed in a dense silken web between the leaves where the larva had fed.

The imago is easily recognized by the bright orange colour of its hind wings. The male measures from 15 mm. to 16 mm. in expanse. Fore wings rich greyish brown, reticulated with darker brown, with a broad deep red-brown fascia from the middle of the costa, where it is narrowest, to the inner margin, where it broadens out, extends to the anal angle, and unites with an irregular triangular patch of the same colour that occupies the apical and hind marginal areas. Hind wings bright orange bordered with black, usually with a few black scales scattered along the veins; but in one of the specimens reared, they are so dense as to almost obscure the orange colour of the wing. Cilia orange.

The female is a larger and more sombre insect. It measures 18 mm. to 22 mm. in expanse, is slightly paler in colour than the male, and the reticulations more clearly defined. The brown fascia is of a duller and less reddish tone, and its central portion is often indicated only in outline, as is also the triangular patch of the apical region. The body in both sexes is ringed with yellow.

The imago emerges during September and October, and its time of flight appears to be in the morning sunshine between eight and ten o'clock.

Lewisham: November, 1906.

THE GENERIC NAME *SCOPULA*.

By Louis B. Prout, F.E.S.

When I wrote on the correct names for the genera formed from the old "*Acidalia*" (Entom. xxxviii. pp. 7–8), I entirely ignored *Scopula*, Schrank ('Fauna Boica,' ii. part 2, p. 162). Although I have long been acquainted with the (apparently overlooked) history of the inception of this genus, I "hoped against hope" that some loophole might be found for escape from its adoption in a corrected sense. However, on looking into the matter again, I am convinced that there is no such escape, and it will therefore be a loss rather than a gain to postpone the inevitable any longer. The genus was erected for two species only—(1) *paludalis* (= *paludata*, L. = *ornata*, Scop., *certo*) and (2) *dentalis*, Schiff. For those few extremists who take the first species to be the type, whether it agrees with the diagnosis or not, this will be decisive in favour of *ornata*; but what will carry more weight with the majority is that the generic diagnosis fits only this species. Treitschke, in 1828, was therefore *ultra vires*

in using the name for a large Pyralid genus commencing with *dentalis*, while some later restrictions (such as Stephens's, in 1834) and type-citations (as Curtis's, in 1830; Duponchel's, in 1831; and Guenée's, in 1854) are manifestly beside the mark.

In a word, that long-suffering genus of Acidaliids, in which veins 6 and 7 of the hind wing are separate, &c., and which has been variously called *Arrhostia* (Herrich-Schaeffer), *Leptomeris* (Meyrick), *Craspedia* (Hampson), and *Emmiltis* (Warren)—not to mention *Dosithea*, Dup., "type *ornata*"—obtains an inalienable right to the older name of *Scopula*, Schrank.

Nov. 7th, 1906.

THE OVUM OF *LAPHYGMA EXIGUA*.

By Alfred Sich, F.E.S.

In October last Mr. South kindly sent me some egg-shells of this species, the eggs having been laid September 8th, 1906, and larvæ hatched out on the 14th of the same month. The eggs were hidden beneath a tangle of long greyish-brown hairs, which under an eighth-objective appeared quite smooth. Some of them measured 1·23 mm. in length. Quite similar hairs occur on the terminal segments of the abdomen of the female imago of *L. exigua*, and one suspects that in laying her eggs she moves the abdomen over them, and the easily detachable hairs remain partly adhering to the eggs. Some eggs, however, which Mr. V. Eric Shaw was kind enough to forward me later (together with the female parent) were not covered with hairs at all; but, as this imago was in a terribly worn condition, she may have already parted with the hairs which otherwise might have covered the eggs. My material was too scanty to allow me to hazard an opinion as to whether the ova of *L. exigua* are or are not normally covered with a tangle of hairs.

In shape this upright egg is a rather depressed sphere, flattened at both poles. The vertical axis measures 0·34 mm., and the horizontal 0·45 mm.; though the shape is not regular, these measurements would suit an average egg. Sculpture: the surface is covered with a network of rather large elongate more or less quadrangular cells, so disposed as to give the effect of vertical primary, and horizontal secondary ribs, especially down the sides of the ovum, where the primary ribs become stronger, and the cells between bear some resemblance to hammer marks on copper. The secondary ribs or walls of the cells run between, but not over the primary ribs. On the top of the egg, as the micropylar area is approached, the primary ribs become weaker and the secondary stronger, so that together they

form a rather open network around the micropyle. The rosette consists of usually, I believe, nine, but sometimes ten or even eleven, cells. These are of an elongate pear-shape, and are arranged in the usual way, with their more pointed apices meeting together in the centre. These cells are not all of the same size, but the whole rosette is usually about 0·07 mm. in diameter. The rather small base of the egg is flattened and smooth.

From the fair state of the empty egg-shells it may be presumed that the larva does not eat the shell after leaving the egg.

DESCRIPTION OF A NEW SPECIES OF *ODYNERUS* (VESPIDÆ) FROM VANCOUVER'S ISLAND.

By P. Cameron.

Odynerus mathewi, sp. nov.

Black, with the following pale yellow: the clypeus, mandibles except the teeth, labrum, a mark more than twice longer than wide and rounded above on the front, a broad line on the lower edge of the eye incision, a short narrow line on the upper part of the outer orbits, a line of almost equal width on the sides of the base of pronotum, tegulæ, a conical mark below them, a line on the base of post-scutellum, the spine on the lower part of metapleuræ, lines on the apices of the abdominal segments (that on first on top only), a small spot on the sides of first segment near the middle, and a large transverse one—its outer side rounded, widened, the inner smaller and transverse—pale yellow. Antennal scape pale yellow below, the flagellum yellow, tinged with fulvous, its hook broad, thick, not much narrowed towards the apex, reaching to the base of the penultimate segment. Wings hyaline, tinged with fuscous violaceous, the stigma and nervures black. ♂. Length, 8 mm.

Vancouver's Island (G. F. Mathew, R.N.).

Clypeus longer than wide, its apex transverse, somewhat broad. Base of thorax transverse, the sides hardly projecting. Apex of post-scutellum broadly rounded. Sides of metanotum broad, rounded, rugosely punctured, not margined. Second abdominal segment if anything wider than long, the apex more strongly punctured than the rest, not reflexed, flat; the yellow band on it is wider than on the others; below it is roundly incised on either side of the middle. Legs pale yellow, the coxæ behind, the fore femora to beyond the middle above, the middle behind and below, the hinder entirely, and the trochanters, black.

Belongs to Saussure's Section B., Syn. Amer. Wasps, 290.

DESCRIPTIONS OF TWO COTTON PESTS FROM WEST AFRICA.

By W. L. Distant.

Mr. G. C. Dudgeon has placed in my hands for determination some Lygæids which he found parasitic on *Gossypium* in West Africa. They all belong to the genus *Oxycarenus*, and include the widely distributed *O. hyalinipennis*, Costa,* and two other species, which are here described. Another specimen, also found on the same plant, may or may not belong to this genus, but is in too mutilated a condition for correct identification.

Mr. Dudgeon is now preparing a report on the cotton pests of West Africa, and will use the names given in this short communication.

RHYNCHOTA.

HETEROPTERA.

Fam. Lygæidæ.

Oxycarenus dudgeoni, sp. n.

Head, pronotum, and scutellum black; hemelytra hyaline, base of corium, the whole of clavus, and a spot at apical angle to corium, black; subcostal vein to corium piceously punctate; abdomen beneath subflavous; sternum black, acetabula, and posterior margins of meso- and metasterna greyish white; legs piceous, tibiæ excluding bases and apices greyish white; antennæ black, bases of third and fourth joints white; head, pronotum, and scutellum coarsely punctate, head about half as long as pronotum, the anterior lobe of which is much shorter than the posterior lobe, and is transversely impressed before the anterior margin; antennæ with the basal joint not quite reaching apex of head, second joint more than twice as long as first, third and fourth joints subequal, each much shorter than second; rostrum shortly passing the posterior coxæ. Long. 3½ to 4 millim.

Hab. Sierra Leone; Moyamba (G. C. Dudgeon).

Allied to *O. breddini*, Bergr., from the Congo region.

Oxycarenus gossipinus, sp. n.

Head, antennæ, scutellum, and clavus black; pronotum testaceous, its anterior and posterior margins centrally narrowly black; hemelytra stramineous, with a small black spot at apical angle, and with a short basal subcostal black line; pro- and mesosterna testaceous, their disks and the metasternum black; acetabula greyish white; legs and rostrum black, tibiæ broadly centrally annulated with stramineous; abdomen beneath ochraceous, stigmatal spots and apex black; head, pronotum, and scutellum thickly and somewhat coarsely punctate; head more than half as long as pronotum, the anterior and posterior lobes of which are

* *Cf.* T. Kuhlgatz, Mt. Mus. Berlin, iii. pp. 53 and 88 (1905).

subequal in length, the latter a little paler than the former, which is slightly globose; antennæ with the third and fourth joints greyish at base, basal joint not quite reaching apex of head, second joint twice as long as first, third and fourth joints subequal in length, each shorter than second joint; rostrum shortly passing posterior coxæ. Long. 3½ to 4 millim.

Hab. Sierra Leone; Moyamba (G. C. Dudgeon).

Allied to *O. exitiosus*, Dist., from South Africa, but to be distinguished by the much more elongate pronotum, and different colour of the same, &c.

ON A FEW TACHINIDÆ AND THEIR HOSTS.

By Claude Morley, F.E.S.

It is well known to lepidopterists that this extensive family of Diptera prey entomophagously upon many kinds of moths and butterflies in almost exactly the same manner as do the Ichneumons, and consequently many correspondents have been so good as to send me from time to time specimens which have appeared in their breeding-cages. Dr. Meade gives (Entom. 1881, pp. 285–9) a very interesting account of twelve species of this family with their hosts, and it may not be out of place "to add my mite"—as he expresses it—in extension of his own paper, although I hope that both combined will be but a fraction of that which we shall, I trust, soon learn from the extensive researches of Mr. Colbran J. Wainwright, to whom, together with Mr. Albert Piffard, Dr. Meade, and Rev. E. N. Bloomfield, I owe the determination of the species.

Exorista jucunda, Mg.

This species was bred in March by Mr. Edward Ransom, at Sudbury, in Suffolk. He writes:—"I bred it from a larva of *Liparis salicis*, but there is no sign, so far as I have observed, that the larva has been attacked by a parasite until it is full-fed, when it spins a cocoon in the usual way. In then dies, and the larval skin breaks, revealing the pupa of its parasite. The parasitical larva does not seem to make its way out of the caterpillar as do the parasites so common on *Pieris brassicæ* [the braconid, *Apanteles glomeratus*, L.], but changes to a pupa in the body of its host, and its presence is not suspected until the caterpillar is found to be dead. I think those caterpillars that are affected do not grow so large as is usual. So far as I have observed, there is only one parasite to each caterpillar. I do not think *jucunda* can be very rare here, as I have often seen the cocoons of *salicis* with the parasitical pupa in them. I assume they are all those

of *jucunda*, as I do not recollect having bred any other kind from *salicis*, nor have I bred *jucunda* from any other species."

Blepharidea vulgaris, Fln.

Mr. E. Goodwin, of Wateringbury, in Kent, has bred four specimens of this common species there from *Thecla quercus* on 20th June. I have bred it at Epsom from *Pieris rapæ* in 1891. Mr. J. Wigin sent me five puparia bred at Methley, near Leeds, from *Acronycta psi* on 15th September. Of these, two died just before emergence of the imagines; one was eaten of Chalcid flies —some small green species of *Pteromalus*, a score of which emerged from a single hole in its side; the fourth was out with its wings fully developed at midnight of 27th May following; and the last, whose wings it was quite easy to *see* stretch and expand, three days later. It is also a common parasite of *Abraxas grossulariata*, from which I possess specimens reared by the late Mr. E. G. J. Sparke at Tooting in November, and by Mr. C. T. Gimingham, at Tottenham, Middlesex, on 21st June. Mr. Hubert Phillips has bred a similar fly, though the species is doubtful, from *Hadena pisi* and *Mamestra brassicæ*. The puparia is, I believe, never concealed within, though occasionally attached to, the defunct larva.

Frontina fugax, Rnd.

On October 7th Mr. Wigin sent me six puparia of this species from Methley, bred from larvæ of *Acronycta psi*. One of these emerged *en route*, and bored through its paper covering, apparently by wetting it with oral fluid, and then bursting through, since one wing was crumpled, perhaps through the extra expense of the fluid. The remainder emerged on, or slightly before, the 18th June following, though one died with only its head discovered. Again, the following autumn, he sent me three more from the same host, which emerged on 26th May, and two on 2nd June of the next year. One of these emerged between 9 p.m. and midnight; another between midnight and 10 a.m. In the same parcel was enclosed a Tachinid, which emerged too crippled for identification, bred from *Plusia gamma* (*cf.* also E.M.M. 1900, p. 244). *F. fugax* appears to be solitary in its parasitism; I possess specimens of the puparia occupying about half, and quite covered by, the old caterpillar's entirely empty skin.

Phorocera serriventris, Rnd.

Mr. J. C. Haggart, of Galashiels, was so good as to forward, on 3rd April, three puparia of this species, which he had bred from Chiswick pupæ of *Acronycta aceris*. The first emerged on the 30th of the same month with fully-developed wings; the other two followed on 8th May—one at 11 a.m., the other a little before midnight—but neither managed to expand its wings. At the

end of May, Mr. Alfred Sich also sent me this species, bred from the same host at Chiswick; and on 25th a puparia from *Acronycta psi*, which emerged as the same species during June. On 16th May, I received another, bred by Mr. F. H. Peachell from a dug pupa of *Tæniocampa gothica*, found at High Wycombe, Bucks, during the preceding April. In the middle of July came three more (dead, I believe) from Mr. A. Bacot, which had been bred by Mr. E. M. Dadd from Belgian *Liparis chrysorrhœa*. Mr. Phillips has also bred a *Phorocera*, probably referable to the present species, from *Spilosoma* (*Arctia*) *menthastri*.

Sisyropa hortulana, Egg.

Among the *B. vulgaris*, bred by Mr. Wigin from *Acronycta psi*, was one specimen of this species, whose puparium is much larger and darker; it was received 15th September, and emerged on 28th of the following May. When first noticed, at 11 a.m., it had no visible wings, but while I watched it I saw, in the course of almost exactly two minutes, the wings fully expand to their normal size, the body at the same time lose its immature transparency, and the frontal sac assume its mature proportions.

Sisyropa lucorum, Rnd.

A specimen of this handsome species was bred in a Lepidoptera breeding-cage in Ipswich in July, 1895.

Tachina larvarum, L.

In March, Mr. Haggart took eight larvæ of *Macrothylacia* (*Bombyx*) *rubi* about Galashiels, of which five each produced a single puparium of this fly about 10th May. These he kindly sent to me, and they all duly emerged during the following month. I probably kept them too dry, however, for they were all dead, with only one fully developed, on 1st July. Mr. W. G. Clutten gave me two dead specimens of this species in August, which he had bred from *Malacosoma* (*Bombyx*) *neustria* at Bungay, in Suffolk.

Tachina rustica, Mg.

Examples which Mr. Piffard thought probably referable to this species have been bred from *Acronycta aceris*, *Hadena oleracea*, and *Mamestra brassicæ* by Mr. Phillips.

Thelymorpha vertiginosa, Fln.

Four specimens of this handsome species were received, dead, from Mr. Clutten in August; they had been reared from *Malacosoma* (*Bombyx*) *neustria* at Bungay, in Suffolk. I have taken the species on the wing myself in the same county, though it is certainly uncommon here.

Baumhaueri gracilis.

A single dead specimen of this species, named by Mr. Piffard, was sent by Mr. Clutten, who bred it from an unknown species of Lepidoptera at Burnley, in August.

Myiobia inanis, Fln.

On October 9th Mr. Clutten sent two Tachinid puparia from Halifax ex *Spilosoma* (*Arctia*) *lubricipeda*, and two others ex dug pupæ of *Tæniocampa* (probably) *instabilis*, from Burnley. Unfortunately the two former died, and their species was undetermined; but of the two latter, one was emerged with very tiny wings at 10.30 a.m. on 22nd June following, and its wings were not fully developed the same evening, though by the morning of 23rd they were fully expanded—how different from those of *S. hortulana*, above!

Erigone radicum, Fab.

From *Arctia lubricipeda*, Mr. Wigin bred eleven puparia of this fine species at Methley, near Leeds, in October, and ten of these emerged between the 5th and 23rd of the following June, though only two remained alive at the latter date. They were in all degrees of development—five with perfect wings, one fully expanded but crumpled, two reaching apex of basal abdominal segment, one emerged but not at all developed, one attached to its puparium by a leg, and two with only their heads protruded.

Plagia ruralis, Fln.

Mr. Clutten has twice sent me batches of this species, bred in both cases at Burnley from *Plusia iota*. The first I received on 3rd August, the second on 16th June. It is a gregarious parasite, and the two larvæ-skins I possess are each a mere bag distended by six close-packed puparia of the fly, which are placed somewhat irregularly, transversely, or obliquely.

Plagia curvinervis, Zett.

One specimen of this species was received on 25th May from Mr. W. M. Christy, who writes that it "emerged from a pot containing pupæ of *gracilis* and one *myrtilli* from the New Forest, and *Dianthœciæ* from West Sussex. As the *gracilis* and their ichneumons have ceased emerging for more than two weeks, probably these flies are referable to the *Dianthœciæ*."

Digonochæta spinipennis, Mg.

I bred this species in the winter of 1895–96, in a box containing, as far as I am aware, only *Scolytus intricatus*, at Ipswich (for Tachinids on Coleoptera, *cf.* E.M.M. 1894, p. 107, &c.); and again, on 14th May, one emerged from its puparium, which I had found beneath the pine-bark of a railing at Sproughton, near Ipswich, on 9th of preceding April.

Thriptocera crassipennis, Mg.

This species I bred in the spring of 1895 from its puparium, which I found among moss near Ipswich.

From the above it will be at once seen how much lepidopterists can, by simply preserving the parasites they may happen to breed, assist in the elucidation of the life-histories of insects of quite distinct kinds. Is it too much to ask that all such may be forwarded to me—more especially the hymenopterous species, since it is upon those that I am especially engaged?* and our motto still is, "By mutual confidence and mutual aid——"!

Monks' Soham House, Suffolk: Nov. 6th, 1906.

BIBLIOGRAPHICAL AND NOMENCLATORIAL NOTES ON THE RHYNCHOTA.

By W. L. Distant.

Mr. Kirkaldy's communication on the above subject (*ante*, p. 247) necessitates some comment. He states, "The following new names are necessary," in the Fulgoridæ, and includes *Kirbyella* to take the place of *Kirbya*, Melich. This unfortunately creates a new synonym.

Genus Kirbyana.

Kirbya, Melich., Hom. Faun. Ceylon, p. 37 (1903), *nom. præocc.*

Kirbyana, Dist., Faun. B. I. Rhynch. iii. p. 262 (1906, March), n. nom.

Kirbyella, Kirk., Entom. xxxix. p. 248 (1906, November).

There appears to be no necessity for the proposed new name *Synaphana* to take the place of *Penthicus*, nom. præocc., *Penthicodes*, Blanch., having been already substituted. The type of Guerin's genus *Aphæna* is *A. fuscata*, from New Guinea, which is structurally distinct from the other species considered congeneric. I have endeavoured to make the question clearer elsewhere (*cf.* Ann. Mag. Nat. Hist. (7), xviii. p. 24).

I quite agree with Mr. Kirkaldy that *Coanaco*, Dist., = *Copidocephala*, Stål, having already published that correction elsewhere (*cf.* Ann. Mag. Nat. Hist. (7), xviii. p. 23).

It is also stated that *Opinus*, Lap., = *Tapeinus*, Lap., = *Sminthocoris*, Dist., and that the writer does "not know why Mr. Distant has added to the synonymy of this Reduviid genus."

* Many hundreds of lepidopterous hosts are recorded in my 'British Ichneumons,' vols. i. and ii.: Keys, Whimple Street, Plymouth.

Opinus is a name only, as Kirkaldy has previous stated in these pages (Entom. 1900, p. 241). "*Opinus* is only mentioned in the analytical tables." That it = *Tapeinus* is a matter of inference only, and such names (*Opinus* has already caused confusion), in my view, should be discarded.

I am glad to see that Mr. Kirkaldy is still pursuing his bibliographical investigations.

A NEW SPECIES OF *ADICELLA* FROM SPAIN.

By K. J. Morton, F.E.S.

Apex of abdomen of male from side.

Through the kindness of Dr. Chapman and Mr. Lucas, I have been enabled to examine a number of Trichoptera, taken by the former in North-western Spain during the past summer. Amongst other interesting species there are two specimens of an *Adicella* which has not been separated hitherto from *Adicella reducta*, McLach., but which is certainly a good and distinct species. The following notes will suffice for its identification:—

Adicella meridionalis, n. sp.

In general appearance and size much resembling *A. reducta*, but differing much in the appendages of the male.

The superior appendages similar to those of *A. reducta*, and the median dorsal process also similar, but much shorter. The upper penis-cover formed of two roof-shaped plates, the angles when viewed from the side somewhat obtuse. Inferior appendages with a broad basal part, the apical part being blade-shaped, and apparently narrower in its proximal portion. The penis-sheaths forked, the branches lanceolate, the upper branch long and projecting, the lower shorter and not always visible. The last ventral segment with a prominent process, broad at the base and gradually tapering.

Two males; Casayo, July 2nd–8th, 1906 (Chapman).

The most essential points of difference are the ventral process, which is absent in *A. reducta*, and the upper cover and sheaths; the cover in *reducta*, in the side aspect, is sickle-shaped, while, as far as I can see, the sheaths in *reducta* are simple, strongly hump-backed before the apices, which are curved downwards, and rather inturned when seen from the side.

I possess another male which I refer to *A. meridionalis*. This was taken by Father Navás at Moncayo, and was one of several which I returned to him at the time under the name of *reducta*. In referring these examples to *reducta*, I had before me the fact that Mr. McLachlan has recorded this species from several localities in Portugal (Eaton). I have not examined any of Mr. McLachlan's material, but this should be done in view of the existence of a new and closely allied species in Spain.

13, Blackford Road, Edinburgh: Oct. 25th, 1906.

NEUROPTERA AND TRICHOPTERA TAKEN BY DR. T. A. CHAPMAN IN SPAIN, 1906.

By W. J. Lucas, B.A., F.E.S.

A short time ago Dr. Chapman was good enough to hand over to me his captures of Neuroptera and Trichoptera made in Spain during the past summer. Some of these specimens, including the Trichoptera, were passed on to Mr. K. J. Morton, who kindly assisted in the identification, especially of these last, of which one—*Adicella meridionalis*, n. sp.—turns out to be new.

Dr. Chapman's headquarters were at Vigo, June 18th–27th; Casayo, July 2nd–8th; Branuelas, July 10th–16th; Pontevedra, July 19th–22nd.

The insects belonging to the Neuroptera are all included in the suborders Odonata and Planipennia, except two female Perlids of the genus *Nemoura*, which without males can scarcely be identified. The remainder belong to the Trichoptera. For purposes of comparison extra-British species are marked with an asterisk.

Odonata.

Sympetrum flaveolum, Linn.—Branuelas.

S. sanguineum, Müll.—Casayo (one female).

Orthetrum cærulescens, Fabr.—Vigo (one male being in teneral condition); Branuelas; Pontevedra.

**Onychogomphus uncatus*, Charp.—Vigo.

Cordulegaster annulatus, Latr.—Vigo; Casayo; Branuelas.

Calopteryx splendens, Harr.—Branuelas (one male).

C. virgo, Linn.—Branuelas.

**C. hæmorrhoidalis*, Lind.—Vigo (one male being in teneral condition).

**Lestes virens*, Charp.—Casayo (one, a male, in rather teneral condition).

**L. barbara*, Fabr.—Vigo (one male).

Pyrrhosoma tenellum, Vill.—Branuelas.

P. nymphula, Sulz.—Branuelas.

**Platycnemis acutipennis*, Selys.—Vigo.

**Ischnura grœllsii*, Ramb.—Vigo (one male).

**Agrion scitulum*, Ramb.—Casayo (one female).

A. mercuriale, Charp.—Branuelas.

PLANIPENNIA.

**Panorpa meridionalis*, Ramb. — Vigo (one female); Casayo (two females). Although no males are present, the identification is no doubt correct.

**Creagris plumbeus*, Oliv.—Vigo; Branuelas.

**Ascalaphus bœticus*, Ramb.—Casayo; Branuelas.

**A. longicornis*, Linn.—Vigo; Casayo; Branuelas; Pontevedra.

**Dilar meridionalis*, Hagen.—Branuelas. The identity of the Spanish examples of this interesting genus is at present somewhat uncertain. Father Navás is investigating the genus as far as Spain is concerned. The three examples in the present collection seem to be *D. meridionalis*.

Hemerobius micans, Oliv.—Casayo (one rather large example).

Chrysopa vulgaris, Schn. — Vigo (one with aberrant neuration, and in that respect resembling a specimen received from Spain by Mr. Morton).

TRICHOPTERA.

**Limnophilus submaculatus*, Ramb.—Branuelas (one female).

**Sericostoma bœticum*, Ed. Pict. — Casayo (several of both sexes); Branuelas (one female).

**Helicopsyche lusitanica*, McL.—Vigo (one male).

**Adicella meridionalis*,† n. sp.—Casayo (two males).

Hydropsyche pellucidula, Curt.—Casayo (one male and one female).

H. exocellata, Dufour.—Casayo (two males).

Diplectrona felix, McL.—Casayo (one male).

**Tinodes fœdella*, McL.—Casayo (one male).

THE DRAGONFLIES OF EPPING FOREST IN 1906.

BY F. W. & H. CAMPION.

THE dragonfly season of 1906 proved to be the most interesting one within our recollection. Not only did we re-take most of the species occurring in our district in previous years, but we were able to add to our local collection, which now consists of twenty species, five species not hitherto represented there—*Brachytron pratense*, *Cordulia ænea*, *Sympetrum scoticum*, and, most important of all, *S. vulgatum* and *S. flaveolum*. The genus

† For description, see page 275.

Sympetrum was especially well in evidence, no fewer than five out of the six British species having fallen to our nets. The exceptionally fine weather which characterized the summer extended far into the autumn, and we enjoyed the unusual experience of taking dragonflies so late in the year as October 21st.

Representatives of seventeen species were obtained, *viz.*:—

(1) *Pyrrhosoma nymphula.*—The taking of immature females of this dragonfly—always our earliest—opened the season on May 13th. It became tolerably common throughout the district, and was last met with on July 22nd.

(2) *Brachytron pratense.* — On May 27th we saw at a pond occupying the site of an old forest gravel-pit what appeared to be a newly-emerged dragonfly resting on a rush far beyond our reach. We threw twigs at it, but, instead of causing it to rise, we only succeeded in covering it up. On the evening of the following day we found the insect occupying much the same position, and, by lashing together two or three sticks, we were able to reach and secure the specimen with the net. It proved to be a female of *B. pratense*, a species new to our collection. It was in good condition save for the undeveloped state of the wings on the right side, a blemish which remained in spite of our keeping the insect alive a day or two longer at home. The circumstances point to the specimen having been bred in the pond where it was found. The species was not met with again during the season.

(3) *Agrion puella* was first found on June 3rd, when some individuals were in a mature state. On June 24th two males bearing a close superficial resemblance to *A. pulchellum* were taken at one small pond. The U-shaped marking on the second abdominal segment was connected by a slender black line with the circlet behind. The base of the marking was thicker than in typical *puella*, and its posterior margin was not so deeply excavated. In a third specimen, taken at the same time and at the same pond, the connection with the circlet behind was not complete; the circlet was crossed transversely by a short median black line, which anteriorly nearly joined a backward process from the U-shaped marking. Another male, with the connection complete, was obtained at a different locality on July 15th. That these specimens must be regarded as *A. puella*, and not as *A. pulchellum*, is clear from the morphological characters which separate the two species. It is interesting to compare this aberration of *puella* in the direction of *pulchellum*, with the variation of *pulchellum* towards *puella* described by Mr. W. J. Lucas in 1901 (Entom. xxxiv. 215). On July 1st we had an opportunity of watching at close quarters a pair of *A. puella* ovipositing; the female was evidently placing her eggs within the bark of the floating twig upon which she was resting, while the male,

which held her *per collum*, poised himself on his wings in an almost erect position. The species was not met with after July 22nd.

(4) *Ischnura elegans* was first taken on June 3rd; it was afterwards very abundant, especially at the end of July, and was collected regularly until September 8th, the latest date which we have yet recorded for the species. A female with the ground colour of the thorax purple was obtained on June 10th. On July 15th we took a very curious female *in cop.* with a normal male. The proximal two-thirds of segment eight were of a colour approaching to that seen in the same segment in var. *infuscans* (dark orange-brown), but the distal third of the segment was occupied by a dorsal black spot having a semicircular front margin. Moreover, there was a thin line of blue at the anterior margin of the segment, and a strong line of blue at the posterior margin. The spots behind the eyes were bright blue, the stripes on the thorax were dull blue, and the sides of the thorax bright green. The smallest male of which we have any knowledge was taken on July 22nd; its measurements were 28 mm. in length, and 31·5 mm. across the hind wings.

Var. *infuscans* was procured on July 1st and 15th, one only on each occasion. In the first specimen, which was taken *in cop.* with a typical male, segment eight was of so dark a hue as to be indistinguishable, so far as colour was concerned, from the other segments of the abdomen. Such a specimen might, if seen alone, be easily mistaken for the female of *I. pumilio.*

(5) *Libellula depressa* was, as in former years, found to be common at the shallower ponds. The earliest specimen was seen on June 3rd; it was secured, and proved to be an incompletely coloured male. The latest observation made was on July 22nd. It is a curious fact that, unlike other observers, we have never seen *L. depressa* flying except over water.

(6) *Cordulia ænea.*—Single specimens of this species—then entirely new to us in the living state—were obtained at ponds near Loughton, June 5th and 10th. A little later it became quite common at a locality further to the north, where we took no fewer than eight examples on June 17th, and four more on July 1st, the last occasion upon which we saw it. All the specimens taken were males, and no immature individuals were noticed. Our attention was drawn by Mr. Lucas to the large size of these insects, and, upon measuring them, we found the smallest to be 49·5 mm. in length and 71 mm. across the hind wings, and the largest to be 53·5 mm. long and 72 mm. in expanse. Females were very seldom seen—probably they were actually very scarce—but on July 1st we had opportunities for watching two of the sex engaged in the business of oviposition. While so employed they neither received assistance from the males nor sought support

from the water-plants, but they dropped their eggs into the water, apparently at random, while hovering upon the wing. *C. ænea* is a beautiful creature to look at in the hand, but it is not very attractive when seen hawking for its prey. An exception must be made, however, in favour of its eyes, the liquid emerald-green of which immediately arrests attention and excites admiration. It is not so difficult to capture as are most of the other larger dragonflies, for its flight, which is very characteristic, is not so erratic, and it is not alarmed so readily. Although it can fly strongly on occasion, it usually glides over the water at one uniformly low level, and quite close to the margins of the pond. It seems to avoid alighting on low herbage, and to prefer resting on bushes surrounding the pond.

(7) *Enallagma cyathigerum* was collected pretty frequently at the particular localities where it occurs from June 10th to August 26th. On the first-named date a blue female was taken attached *per collum* to a very brilliantly coloured male, and a female of the typical form was obtained at Walthamstow on July 8th.

(8) *Libellula quadrimaculata* is always scarce in Epping Forest, and for the only specimen obtained during 1906 our thanks are due to a stranger. On June 17th, he, seeing us engaged with other dragonflies, himself pursued and secured a male, which he afterwards kindly gave to us.

(9) *Anax imperator* was much commoner than usual, but a male taken on July 1st was the only specimen secured. On the date named we watched two females ovipositing, without any aid from the males, in a shallow arm of a large pond. It has been remarked that the sense of hearing in dragonflies appears to be in a very rudimentary state, and we have obtained a striking confirmation of this view. We were watching a male *A. imperator* at a pond abutting upon the main road through the forest. Motor cars and bicycles and other vehicles were passing in an incessant stream, but, although the pond was a fairly large one and more retired ponds were near at hand, the insect continued its flight, without manifesting the slightest alarm or irritation, parallel with the road, and at a distance of not more than a few feet from its noise and dust.

(10) *Æschna grandis* was first seen and taken on July 22nd, when it was common; it afterwards became quite scarce, and was not observed after the first week in September.

(11) *Æ. cyanea.*—This dragonfly, which is always abundant with us, was first taken on July 29th. On September 30th we came across a female so intent on oviposition as to pay little or no heed to our near approach; she was crawling along a fallen tree-trunk lying beside a small pond much frequented by the species, and inserting her ovipositor into the interstices of the

wood and bark. As late as October 21st a male was captured on the wing, a date later by a full month than our previous latest record for the species.

(12) *Sympetrum striolatum* was not taken earlier than July 29th. We did not find it really common until October 14th, and it was still pretty plentiful a week later (October 21st), when it was last met with. A female of extraordinary size was taken on September 9th; it measured 43 mm. in length, and 65 mm. across the hind wings. On the same date some females were obtained having a considerable amount of red upon the abdomen.

(13) *Lestes sponsa.*—As was the case last year, this pretty little insect was not found within the limits of Epping Forest, as strictly defined. On August 8th, however, a visit to Coopersale Common, one of Doubleday's favourite localities to the north-east of Epping, revealed an abundance there of both males and females.

(14) *Sympetrum flaveolum.*—We took this species, which has not been previously recorded from the British Isles since 1900, pretty plentifully in Epping Forest from August 8th to September 2nd. On the first-named date a single male was obtained near Epping. On August 12th, when we revisited the old gravel-pit which had produced *Brachytron pratense* earlier in the year, we were fortunate enough to get a female, in addition to four males. The same pit yielded eight more males a week later. The last specimen, a solitary male, was taken on September 2nd at a neighbouring pit, at which not a single example had been hitherto seen. It seems almost certain that these insects had not originated at the ponds where they were taken, for they appeared suddenly, at the principal site at all events, fully matured; moreover, several of them presented broken wings or legs. We found this dragonfly to differ in some of its habits from the common species of the same genus, for not only did it seem to be as active on dull days as on bright ones, but it manifested none of the fondness of its congeners for returning again and again to precisely the same spot. It is worthy of remark that a search for the species at the larger sheets of water proved unavailing. Our specimens were got at wet hollows more or less overgrown with rushes; and in all cases we found the insects, when not on the wing, resting about midway down the stems of the rushes. The general agreement of their coloration with that of the rush flowers, added to the grasshopper-like spring with which they commenced their flights, rendered successful pursuit a matter of great difficulty. Their flights were neither very rapid nor very prolonged, but, when an individual was very closely pressed, it sometimes took refuge in the tops of tall trees. The large saffron patch at the base of each hind wing readily distinguished *S. flaveolum* from its allies, even on

the wing. In the living males the colour of the thorax appeared to us to be, not deep red, as has been stated, but brownish, in decided contrast with the red of the abdomen. Females of this species are seldom met with in Great Britain, and the latest recorded capture was that made by Mr. B. Harwood at St. Osyth, Essex, on August 21st, 1899. In the wings of our specimen the small saffron patch at the cubital point is connected by a streak of the same colour with the large basal patch. The measurements agree with those of the two Continental specimens referred to in Mr. Lucas's 'British Dragonflies,' the length being 33 mm., and the width across the hind wings 56 mm.

(15) *S. vulgatum.*—On September 4th we took a *Sympetrum* which we at once suspected to be *S. vulgatum*, a dragonfly but thrice recorded, with authority, as a British insect. It was a male, and appeared to be the sole representative of its kind then present, although other *Sympetrum* dragonflies, including at least one *S. sanguineum*, were flying in its company. We were led to distinguish it from *S. striolatum*, with which the rare species is frequently confused, by the uniform brownness of the sides of the thorax, crossed only by black lines, and by the richer coloration and more pronounced posterior expansion of the abdomen. Closer inspection showed that the vertical black line upon the frons where it abuts upon the eyes, a character proper to *vulgatum*, was present in our specimen, and that the wings were more hyaline than the wings of the common species, which are frequently tinged with brown. The measurements were found to be: length 40 mm., expanse of hind wings 59 mm. The specimen was subsequently submitted, for examination, to Mr. K. J. Morton, of Edinburgh, who determined it to be *S. vulgatum*, "beyond all question," and courteously furnished us with material for the comparative study of the genitalia, the real test of distinctness, in the two allied species. The previous British records for *S. vulgatum*, for which we are indebted to Mr. Lucas, relate to single male specimens, all taken south of the Thames, *viz.*, by Mr. C. A. Briggs, Bookham Common (1891); Mr. W. J. Lucas, Richmond Park (September 11th, 1898); and Mr. A. H. Hamm, Torquay (August 15th, 1899).

(16) *S. sanguineum* was met with for the first time since 1903. It occurred very sparingly, only two males being taken, one on September 4th, and the other on the 8th; both specimens were flying over ponds some miles to the north of our old locality for the species.

(17) *S. scoticum.*—On September 8th we detected at a pond near Loughton two or three specimens of this species, not hitherto seen by us in the forest, flying over the horsetails (*Equisetum*), which partly filled the pond. After much time spent in waiting for an opportunity, a male was at length cured, and we were thus enabled to add the species to our

Epping Forest list. A solitary specimen was seen at another pond as late as October 14th, but it could not be taken.

Æschna mixta was probably seen on one or two occasions in October, but a capture was not effected. It is somewhat remarkable that, notwithstanding the unusual abundance of *Ischnura elegans*, not a single female of the orange variety (*rufescens*) was met with.

Erratum.—By a misprint in our note on *Orthetrum cærulescens* in Essex (*ante*, p. 160), we were made to say that "we *were* unable to find any other record of the occurrence of the species in Essex," instead of "we *are* unable," &c., which was what we wrote.

33, Maude Terrace, Walthamstow, Essex:
November 13th, 1906.

CURRENT NOTES.

By G. W. Kirkaldy.

(Continued from p. 203.)

33. Reuter, O. M.: "Hemipterologische Spekulationen. I. Die Klassification der Capsiden." Festschrift für Palmén. No. 1, pp. 1–58, and a genealogical tree (dated 1905, but probably published in 1906) [Hemiptera].
34. Perkins, R. C. L.: "Leaf-hoppers and their Natural Enemies—Introduction." Bull. Hawaiian Sugar Planters' Div. Ent. i. pp. i–xxxii, 8 figs. (May 1st, 1906).
35. *Id.*: "Ditto, pt. 1, Dryinidæ." *Op. cit.*, 1–69 (May 27th, 1905) [Hymenoptera].
36. *Id.*: "Ditto, pt. 2, Epipyropidæ." *Op. cit.*, 71–85, 3 figs. (June 3rd, 1905) [Lepidoptera].
37. *Id.*: "Ditto, pt. 3, Stylopidæ." *Op. cit.*, 87–111, plates i.–iv. (Aug. 8th, 1905) [Coleoptera].
38. *Id.*: "Ditto, pt. 4, Pipunculidæ." *Op. cit.*, 119–57, plates v.–vii. (Sept. 9th, 1905) [Diptera].
39. Terry, F. W.: "Ditto, pt. 5, Forficulidæ, Syrphidæ, and Hemerobiidæ." *Op. cit.*, 159–81, plates viii.–x. (Nov. 13th, 1905) [Orthoptera, Diptera, and Neuroptera].
40. Perkins, R. C. L.: "Ditto, pt. 6, Mymaridæ, Platygasteridæ." *Op. cit.*, 183–205, plates xi.–xiii. (Nov. 13th, 1905) [Hymenoptera].
41. Swezey, O. H.: "Ditto, pt. 7, Orthoptera, Coleoptera, Hemiptera" [*i. e.* Heteroptera]. *Op. cit.*, 207–38, plates xiv.–xvii. (Dec. 30th, 1905).

42. PERKINS, R. C. L.: "Ditto, pt. 8, Encyrtidæ, Eulophidæ, Trichogrammidæ." *Op. cit.*, 239–67, plates xviii.–xx. (Jan. 6th, 1906) [Hymenoptera].
43. KIRKALDY, G. W.: "Ditto, pt. 9, Leaf-hoppers." *Op. cit.*, 269–479, plates xxi.–xxxii. (Feb. 3rd, 1906) [Hemiptera].
44. PERKINS, R. C. L.: "Ditto, pt. 10, Dryinidæ, Pipunculidæ, Supplementary." *Op. cit.*, 481–99, plates xxxiii.–xxxviii. (March 1st, 1906) [Hymenoptera, Diptera].
45. KIRKALDY, G. W.: "Ditto, Index, Errata," &c. *Op. cit.*, 501–8, and 2 pp. (May 1st, 1906).
46. FRIEDERICHS, K.: "Zur Biologie der Embiiden . . ." Mt. Zool. Mus. Berlin, iii. 213–39, text-figs. 1–19 (April, 1906) [Neuroptera.]
47. BUTTEL-REEPEN, H. von: "Apistica. Beiträge zur Systematik, Biologie, sowie zur Geschichtlichen und Geographischen Verbreitung der Honigbiene (*Apis mellifica*, L.) ihrer Varietäten und der übrigen Apis-Arten." *Op. cit.*, 117–201, text-figs. 1–8 (April, 1906) [Hymenoptera].
48. HOLMGREN, N.: "Studien über Südamerikanische Termiten." Zool. Jahrb., Abt. Syst., xxxiii. 521–676 [Neuroptera].
49. PERKINS, R. C. L.: "Entomological and other Notes on a Trip to Australia." Proc. Hawaiian Ent. Soc. i. 8–11 (April 3rd, 1906).
50. *Id.*: "Notes on a Collection of Butterflies made during a Recent Trip to Australia." *Op. cit.*, 23–5 [Lepidoptera].
51. VAN DINE, D. L.: "Notes on a Comparative Anatomical Study of the Mouth-Parts of Adult Saw-Flies." *Op. cit.*, 19–22, plates 1–2 [Hymenoptera].
52. OSBURN, R. C.: "Observations and Experiments on Dragonflies in Brackish Water." Amer. Nat. xl. 395–9 (June, 1906) [Neuroptera].
53. JACKSON, C. F.: "Key to the Families and Genera of the Order Thysanura." Ohio Nat. vi. 545–9 (June, 1906).
54. DISTANT, W. L.: "A Synonymic Catalogue of Homoptera. Part 1. Cicadidæ." (London, British Museum), 1–207.
55. PAWLOWSKY, E.: "Über den Stech- und Saugapparat der Pediculiden." Zeitschr. Wiss. Insektenbiol., ii. 156–62, figs. 1–4 (June 18th), and 198–204, figs. 5–13 (July 10th, 1906).
56. DOFLEIN, F.: "Ostasienfahrt. Erlebnisse und Beobachtungen eines Naturforschers in China, Japan, und Ceylon." (Leipzig), i–xiii and 1–512, 18 plates, 5 maps, and numerous text-figures (1906).
57. GIRAULT, A. A.: "The Present Status of the Bedbug in the Transmission of Human Diseases." Journ. Amer. Med. Ass. xlvii. 85–7 (July 14th, 1906) [also sep. 1–8].

Reuter's memoir (33) on the classification of the Miridæ (Capsidæ) is the most important paper on the Heteropterous Hemiptera issued for some time, and is specially noted here, since it is practically a separate publication. The learned Finlander resents Distant's allegation (in the 'Fauna of British India—Rhynchota,' vol. ii.) that the current classification of Miridæ is more for cabinet-arrangement purposes than as exhibiting a philosophical conception, and refutes Distant, showing, in great detail, that the English author's groups are entirely artificial, and that his own are based, as far as present knowledge permits, on philosophical principles.

The first bulletin of the Hawaiian Sugar Planters' Division of Entomology (34–45) comprises some 542 pages, with thirty-eight plates and eleven text-figures, and deals with the Fulgoroid and Tetigonioid Hemiptera (principally those of Australia), and their enemies. The main scope of the work is biologic and classificatory, but there are also described 120 new genera and subgenera, and 356 new species and varieties, principally in parasitic Hymenoptera and in Siphonata (Homoptera). The contents of the bulletin may be summarized as follows:—

Parts 1, 6, 8, and 10 deal with the parasitic Hymenoptera. It is remarkable that the Dryinidæ which attack Tetigoniids (Jassids), while often superficially resembling others parasitic on Asiracids (Delphacids), "always differ essentially in the structure of the chelæ from the latter. Consequently the same species, or rather the same genus, does not attack both of these indiscriminately. The nature of the larval sac is explained, and a similar sac is shown to exist outside the group in an anomalous insect (possibly allied to *Embolemus*) parasitic on Orthoptera. . . This is also the case with some European Belytidæ, which also form larval sacs on small Jassids. The economic value of Dryinidæ is discussed, and the effect of hyperparasites on their utility; some species reproduce parthenogenetically, though males occur." Parthenogenesis is shown to be usual in some Mymaridæ. Part 2 deals with the parasitic Lepidoptera of the Epipyropidæ. Their habits are given, and the remarkable form of the young larva is described. In part 3, some forms of the coleopterous family "Stylopidæ are discussed, their habits, the effect of their attack on their hosts, the frequent occurrence of a parasitic fungus in connection with their attack, the structure of larvæ and adults." The habits, and the form of the larvæ and puparia of the Dipterous family Pipunculidæ occupy part 4. The life-histories of the Forficulid *Chelisoches morio*, and of the lacewing *Chrysopa microphya*, are detailed in part 5. The life-histories of the Locustid *Xiphidion varipenne* (formerly confused with the European *X. fusca*), and of some Coccinellidæ and Heteroptera, are discussed in part 7. Part 9 is devoted to the leaf-hoppers of the superfamilies Tetigonioidea and Fulgoroidea. A summary

of what is known of their life-histories, of their systematic position and classification, with criticisms on the latter, is given, their external structure dealt with at some length, as well as such topics as polymorphism of the organs of flight. The introduction gives a general account of Koebele and Perkins's expeditions to Australia, Viti, and the United States; deals with the most approved mode of handling beneficial insects, summarizes the previous parts of the bulletin, and lists the parasites and their hosts.

The biology of certain "Neuroptera" has been discussed recently, *viz.* that of the Embiidæ by Friederichs (46), Termites by Holmgren (48), and Dragonflies by Osburn (52).

Buttel-Reepen (47) deals with the Honey-bee, *Apis mellifica* (recte *mellifera!*). First, there is a reprint of Gerstaecker's scarce work on the geographical distribution and races of the Honey-bee, published in 1862. The original home of the bee, its biology, and that of its varieties and allies are then discussed at considerable length.

Perkins (49) briefly records his impressions of an entomological trip to Eastern Australia, and subsequently (50) makes remarks on the typical Rhopalocera of Queensland.

Doflein's (56) work deals with his travels in China, Japan, and Ceylon, and is fully illustrated. It is of a general character, treating of anthropology, zoology, botany, pisciculture, and so forth. But, in the last three chapters especially, there are many notices on insects—birds hunting butterflies, mimicry, butterflies' sense-organs, termites (a whole chapter being devoted to these), ants, and coccids.

Van Dine (51) discusses in detail the mouth-parts of the Tenthredinidæ, illustrating his studies by two excellent plates.

Pawlowsky (55) has published an account of his studies on the mouth-parts of fleas.

Distant's Catalogue of the Cicadidæ of the World (54) supplies a long-felt want, though it is a pity it was not issued as a part of Lethierry and Severin's well-known series. It would also have been better to give the geographical distribution in greater detail. As is often the case with this author, accuracy of dates seems a minor matter. The work is more than a mere list, as analytical tables of the genera in each "division" are provided, and the larger genera are divided into sections of which the characters are stated; a synopsis of the divisions themselves would have been useful, as one has now to refer to two volumes of a magazine to compare the several divisional diagnoses. Amyot's mononymics, accepted by Distant, have no place in binomial nomenclature. They were "species," and avowedly proposed to replace the Linnean method. *Cicadetta*, Kolenati, should then replace *Melampsalta*, Kol., and the other "names" of Amyot, attributed to Kolenati.

On p. 146, *Cicada angulata*, Hagen, is cited as a synonym of *Tibicen annulatus*; on p. 168 it is given by Distant as a synonym of *Cicadetta hageni*. On p. 28, *Cyclochila australasiæ* var. *spreta*, God. & Frogg., 570 has been omitted. The genus *Tibicen*, Latr., has been altogether ignored! In 1825 (Fam. Nat.) Latreille mentioned it, giving "*plebeia*" as the type, but not describing the genus. The same was done in 1827 in the German translation. I cannot now refer to Cuvier's 'Règne Animal," vol. v. p. 215 (1829), but apparently Latreille therein founded *Tibicen* with type *plebeja* (=*hæmatodes*, Scop., or perhaps Latreille referred to the species as *hæmatodes*, a matter of no account, however, in this connection). If not, then Burmeister, in 1835, was responsible for its erection; so that in any case it must supersede *Tibicina*, Fieber, used by Distant (who attributes it wrongly to Amyot).

Girault (57) discusses in an interesting manner the status of *Clinocoris lectularius* in the transmission of human diseases. Nothing has as yet been definitely proved against the bedbug, but it is now regarded with deep suspicion as being implicated in the dissemination of syphilis, leprosy, tuberculosis, bubonic plague, and other diseases.

NOTES AND OBSERVATIONS.

Pionea decrepitalis, H.-S., and Herminia tentacularia, L., var. modestalis, Heyd., in Northern Scandinavia.—Since the publication of my notes on the insects captured and observed by me in Northern Scandinavia, Mr. L. B. Prout has finally determined the only two unidentified species as belonging to the above. Neither *Herminia* var. *modestalis* nor the type occur in Britain, and it is now reported from the Abisko district of Lapland (? Bossekop also), so far as I know, for the first time. *Pionea decrepitalis* is recorded as "very rare" in Leech's 'British Pyralides,' and the British localities given are all in the highlands of Scotland. From the references in Staudinger's Catalogue (ed. 1901) it seems to be generally distributed in the mountains of Norway and Lapland. These specimens have now been placed in the British Museum Collection.—H. Rowland-Brown; Oxhey Grove, Harrow Weald, Nov. 17th, 1906.

British Setting.—It is to be hoped that no beginner will be misled by the remarks on this subject in the November number to imagine that flat setting-boards are a necessity. In my humble opinion they are an abomination, for not only do they give the insect an artificial appearance, making it look as if cut out of paper, but in a considerable proportion of insects so set there is an invincible tendency for the wings to spring up and meet over the thorax. I think the boards now made with a very slight oval by Watkins and Doncaster (and doubtless by others) are just perfect, and, like the tramp with Pears's soap,

since trying them I have used no other. — (Rev.) W. Claxton; Navestock Vicarage, Romford.

Early Stages of Limenitis sibylla.—On August 15th last, in the New Forest, a search was made on the honeysuckle for the eggs of the "white admiral" butterfly. It was not difficult to find them near the margin of the leaf, but it was a week or two too late—all found were empty. A number of little larvæ were seen, some of which were probably a fortnight old, and by their size were nearly ready to go into hybernation. They feed from the tip of the leaf downwards, leaving the midrib, on which some were resting. Usually a bit of the leaf left uneaten had curled up and turned brown, reminding one of the appearance of the hybernaculum. It almost looked as if this had been brought about by the foresight of the little brown larvæ as a means of protection!—W. J. Lucas.

Gnophos obscuraria at rest.—On July 30th last a visit was made to a locality of this insect near Brockenhurst, in order to obtain photographs of it in its resting position. Several were found, but only by disturbing them—not one was discovered *in situ*. They were resting on the grey or brown soil above the sand on the sides of a small pit. When after being disturbed they were watched down again, they usually almost defied detection. Often they hid away in a small chink, but their colouring is so protective that this hiding away seemed scarcely necessary.—W. J. Lucas.

Potamanthus luteus.—One female specimen of this mayfly, little known as British, was taken at the River Itchin, near Eastleigh, on August 14th, 1906. Records for it are chiefly from Weybridge. A characteristic feature is the process or lobe on each side of the ninth abdominal segment. I have to thank Mr. C. A. Briggs for identifying the specimen.—W. J. Lucas.

Resting Habit of Satyrus semele.—Early in the morning of July 30th last I noticed one of these butterflies settle two or three times in the bright sunshine on a sandy track in the New Forest. It adjusted itself somewhat after settling, but not so that the shadow thrown was a line. In fact, it seemed purposely to arrange itself so that a broad shadow was produced. This, however, did not seem to make it more conspicuous, for other objects threw shadows. The last time it lay with its wings nearly flat on the sand, when of course there was practically no shadow.—W. J. Lucas.

Cleaning, Relaxing, and Resetting Lepidoptera.—First remove the data-labels. Should an insect be dull or dusty, brush the wings lightly with a piece of cotton-wool; I prefer cotton-wool to a camel-hair brush. Brush from the base of the wings outwards; then brush the body from the thorax downwards. Not a scale will be disturbed, and the appearance of the insect will be much improved. If the insect be a clearwing, immerse it wholly in benzine, chloroform, or benzoline for a week or a fortnight after brushing. Greasy bodies of other species should be broken off close to the thorax, and steeped in benzine, &c., as above. Refix the bodies with shellac dissolved in spirits of wine; add a little Stephens's liquid gum, and stir it up well. Pointed forceps,

as sold by chemists, will be found useful. Take care, in refixing the abdomen, to get the natural pose as nearly as possible. Apply the shellac, &c., with a blunted setting-needle in preference to a brush. For relaxing purposes get a good-sized shallow meat-dish with cover; cheap tin ones can be bought in any market for a few pence. Fill the dish nearly full with clean sand, add a little water, but only sufficient to make the sand *damp*—never *wet*. Mix fifteen drops of carbolic acid with the sand to prevent the formation of mould. Cover the sand with a piece of clean blotting-paper, and lay the insects on the blotting-paper; place a piece of blotting-paper over the insects to check possible condensation; lastly, put on the dish-cover. A couple of days, as a rule, will be sufficient to relax any moth or butterfly. The wings should not be allowed to get wet, or they will be spoilt, especially in the case of whites, blues, &c. Before re-setting it is often desirable to re-pin. The old pin is to be got rid of without damage to the specimen. Press the nails of the thumb and forefinger of the left hand close together so as to form a *sensitive* vice; grasp the pin with this vice—underneath the insect, and closely touching the thorax. Press the pin downwards, using the first finger of the right hand. Having loosened the pin, press it up again through the thorax, and see that it is clean. Stick the pin, with the insect, into a piece of cork; then, with two setting-needles pressed on the thorax close to the pin, free the insect entirely. When inserting a fresh pin use the hole through the thorax made by the old pin. A slight departure from the angle made by the old pin will render firm the new one. Resetting now follows, and the wing-surfaces should by this time be free from damp. In resetting, the front legs should be stretched out obliquely so as to be well shown. Loose antennæ, as well as wings, are best replaced while the insect is resting in the groove of the setting-board. The edges of the groove act as supports. Care should be taken that such antennæ or wings are relaxed, or they will easily break, especially the antennæ. As a rule, the insects will be dry in a week. As a further safeguard against mould, place them a yard in front of a moderate fire for a quarter of an hour; then take them off the setting-boards, refix the data-labels, and they are ready for the cabinet.—J. Arkle; Chester.

CAPTURES AND FIELD REPORTS.

Manduca (Acherontia) atropos at Chichester.—Several larvæ of *Manduca atropos* were found here in potato-fields during the month of September, and pupæ dug up.—Joseph Anderson; Chichester.

Notes from Chichester.—*Macroglossa stellatarum*, in company with *Pyrameis atalanta*, was a frequent visitor this year to the garden, and one I noticed on the evening of October 2nd was hovering over geranium flowers in the border (with much enjoyment apparently) in the midst of torrents of rain and high wind. The last date this season that I saw any of the "whites" was on October 25th—one of the many beautiful sunny days of that month—when a *Pieris rapæ* was settled on the blossom of a white cactus dahlia, in which position it

so closely resembled the petals of the flower as almost to escape detection.—JOSEPH ANDERSON; Chichester.

LATE OCCURRENCE OF SPILOSOMA MENDICA.—Last night Mr. H. J. Baker, a brother entomologist and colleague of mine, captured a specimen of this moth, in beautiful condition, on the window of his room, which had evidently been attracted by the light. I think this is rather an exceptional occurrence, is it not? It must, of course, be due to the very warm autumn we have had.—W. A. BOGUE; Woodspring, London Road, Salisbury, November 4th, 1906.

LITHOSIA CANIOLA AT BOURNEMOUTH.—On August 22nd I took at light a freshly-emerged specimen of *L. caniola* of yellowish colour. The local collectors do not seem familiar with it so far east.—(Rev.) ARCHIBALD DAY; Malvern Link.

LAPHYGMA EXIGUA IN SURREY.—I have been fortunate in rearing two examples of this rare British Noctuæ from ova obtained from a female captured on August 27th last (*ante*, p. 212). The larvæ fed up very rapidly on dock and plantain, and pupated on September 24th and 27th, forming a slight earthen cocoon, attached to the side of the breeding-cage, about half an inch below the surface of the soil. The pupæ were kept in a warm room, and the imagines emerged on October 26th and 27th.—ERNEST WARNE; "Mount," Liverpool Road, Kingston Hill, November 3rd, 1906.

LAPHYGMA EXIGUA IN WILTSHIRE. — I was fortunate enough to capture a very good specimen of *Laphygma exigua* on the inside of a street gas-lamp on the night of October 21st last.—W. A. BOGUE; Salisbury.

HELIOTHIS PELTIGERA IN SOUTH DEVON.—Whilst at Sidmouth, South Devon, in August last, I took about thirty larvæ of *H. peltigera* feeding on *Ononis*. From these I obtained eighteen pupæ, four of which dried up at once. I placed the remaining fourteen pupæ in a flower-pot on the kitchen mantel-shelf. Imagines emerged at dates varying from September 18th to October 10th, a dozen fine specimens and two cripples.—B. H. CRABTREE; Cringle Lodge, Levenshulme, Manchester, October 25th, 1906.

HELIOTHIS PELTIGERA IN DORSETSHIRE.—On August 10th last I took a fresh example of this species, on heather bloom, near Wimborne.—GERVASE F. MATHEW; Dovercourt, November 7th, 1906.

LEUCANIA VITELLINA IN WEST CORNWALL. — When forwarding my list of captures, dated 23rd inst., I had a moth which I could not identify. It has since been authenticated as *L. vitellina*, and is a grand specimen in perfect condition, undoubtedly freshly emerged from the pupa. I took it last month on the coast at sugar about 8.30 p.m. Is not this a record for the county?—W. A. ROLLASON; Lamorna, Truro, Cornwall, October 27th, 1906.

PIERIS DAPLIDICE IN DEVON AND CORNWALL.—This year, on August 10th, in Newton Abbott, South Devon, I captured *Pieris daplidice*, and also a very battered specimen at the Lizard on September 13th.—

M. Lyon; 86, Kensington Park Road, London, W., November 8th, 1906.

Colias edusa in Hants.—The records of the occurrence of this species during the past season have been very few, so it may be interesting to note that on August 13th, when I was riding between Wimborne and Ringwood, a fine fresh-looking male crossed the road in front of me just before I entered the latter town. This is the only one I have seen.—Gervase F. Mathew; Dovercourt, November 7th, 1906.

Plusia moneta in Cheshire.—My friend Mr. H. S. Slade recently showed me a somewhat worn specimen of *P. moneta*, which his father had captured in his house early in September, the moth having been attracted to the room by light. Another friend also records the finding of two pupæ of this species on monkshood at Bramhall, in the same county. The imagines appeared early in September.—B. H. Crabtree; Cringle Lodge, Levenshulme, Manchester, October 25th, 1906.

Interesting Planipennia (Neuroptera).—On October 17th last, Mr. G. C. Champion gave me two specimens each of *Micromus variegatus* and *Sisyra fuscata*, taken recently at Woking, in Surrey.—W. J. Lucas.

Dipterygia scabriuscula in September.—This species seems to be rather erratic in its time of appearance. I generally expect to see it at sugar about the end of the first week in July, but in 1905 I took rather a worn specimen as early as May 29th, and this year a fine fresh example as late as September 6th; the latter no doubt from June or July parents. I have on several occasions bred large numbers from the egg. It is an easy species to rear, the larvæ feeding up rapidly on knot-grass; but each time I have bred them, more than half the moths have emerged the second year.—Gervase F. Mathew; Dovercourt, November 7th, 1906.

Deilephila livornica, Sphinx convolvuli, and Laphygma exigua at Lewes, Sussex.—A specimen of *D. livornica* was brought to me about June 26th, and I took one example of *L. exigua* at light. Three records of *S. convolvuli* have come under my notice; one, which I possess, being a very large and fine specimen. *L. exigua* is, I believe, a new record for Lewes, but a single specimen was taken at Brighton, by Mr. Vine, in 1884. *D. livornica* has been captured at Lewes on several previous occasions, but not recently. Mr. Tonge, however, exhibited a living larva of this species at the meeting of the South London Entomological and Natural History Society held on August 9th last.—W. Jarvis; 22, Leicester Road, Lewes, October 29th, 1906.

Deiopeia pulchella in Sussex.—Some time towards the end of September I noticed a moth in a spider's web, but although passing the spot almost every day, I did not consider it worth while to climb up and inspect it. After passing and repassing the insect some forty times or so, my curiosity was aroused, and climbing up, I secured the enveloped moth. You may imagine my surprise when I found that the insect was a specimen of *D. pulchella*. Luckily I managed to relax and extricate it from the web, and it now graces my collection. It is

in very fair condition, only a portion of one of the antennæ and just a *morceau* of one of the fore wings spoiling an otherwise perfect specimen.—W. Jarvis; 22, Leicester Road, Lewes, October 29th, 1906.

Deiopeia pulchella, Deilephila livornica, Laphygma exigua, &c., in West Cornwall.—I took a beautiful specimen of *D. pulchella* in my garden on October 3rd last, about 1.45 p.m. My little daughter first noticed it at rest on a strawberry plant; it was easily disturbed, and attempted to fly away, but the costal nervure of the left upper wing was broken, so that its flight was short, and it was easily boxed. The day was close and warm, with occasional sunshine—direction of wind N.W. by W., but scarcely perceptible; there was a westerly gale of wind and rain the day before, and two days previously a southerly gale of wind and rain. Of *Polia xanthomista* I took twenty-eight specimens this year (and twenty-seven specimens last year), and have this year succeeded in obtaining a considerable number of ova. *D. livornica* was taken on June 8th inside a kitchen window, and is a fairly good specimen. Of *Eupithecia constrictata* I bred three imagines, June 11th to 19th, from larvæ obtained last year in August by searching wild thyme at night by the aid of a lantern. Of *L. exigua* I took a single specimen at sugar last month. *Epunda lichenea*, a single specimen on a gas-lamp on September 26th; and *Nola confusalis*, on June 8th, at rest on palings.—W. A. Rollason; Lamorna, Truro, Cornwall, October 23rd, 1906.

Melanthia albicillata: a Correction.—I very much regret that through a clerical error *Melanthia albicillata* (*ante*, p. 258) was given as double-brooded; this should have been *Larentia viridaria*.—H. D. Kenyon; Lamorna Villas, Mount Charles, St. Austell, Nov. 13th.

SOCIETIES.

Entomological Society of London.—*Wednesday, October 17th*, 1906.—Mr. F. Merrifield, President, in the chair.—Mr. H. St. J. Donisthorpe showed living examples of the beetle *Mononychus pseudacori*, and seed-capsules of *Iris fœtidissima*, which contained more specimens, found at Niton, Isle of Wight, where the species occurred commonly.—Mr. A. H. Jones exhibited specimens of *Pieris napi* var. *bryoniæ*, *Argynnis thore*, *Erebia glacialis* ab. *pluto*, a small form of *Lycæna arion* from Arosa, Switzerland, at 6000 ft.; a variety of *Melanargia galatea*, in which the dark patch on the under side of the hind wings was much enlarged; and two varieties of *Argynnis niobe* (female), one very pale, the other of a bluish copper colour, taken on the Splugen Pass in July last; also specimens from other localities for comparison.—Mr. W. J. Kaye exhibited a fine example of the remarkable moth, *Dracenta rusina*, Druce, from Trinidad. The species bears a wonderful resemblance to a decayed dead leaf, the patches on the wings suggesting the work of some leaf-mining insect.—Mr. E. M. Dadd showed a number of Noctuids common to the British Isles and Germany, and, remarking on the insular racial characters of some British Lepidoptera as compared with the predominant form occurring

on the continent of Europe, said that while England was the home of many dark races, e. g. *Polia chi* var. *olivacea*, *Amphidasys betularia* var. *doubledayaria*, the dark forms of *H. abruptaria*, &c., it was all the more curious that in the twenty-two species of Noctuæ enumerated the tendency was always for the British form to be lighter and the continental darker.—Dr. F. A. Dixey exhibited specimens of *Ixias baliensis*, Frühst, and *Huphina nerissa*, Fabr., from the island of Bali, Malay Archipelago. He said that in this instance the *Huphina* had, on the whole, acted as the model, under whose influence the *Ixias* had drifted some distance away from the usual aspect of its genus; but in the particular case of the hind wing the process was reversed, the *Ixias* having been the model, and in its turn mimicked by the *Huphina*. If his conclusions generally were well founded, the associations between the two must necessarily be Müllerian and not Batesian.—Mr. S. A. Neave exhibited a number of Lepidoptera selected from the collection made by him in North-east Rhodesia in 1904 and 1905, comprising the following rare species:—*Melanitis libya*, Distant; *Leptena homeyeri*, Dewitz; *Pentila peucetia*, Hew.; *Catochrysops gigantea*, Trim.; *Crenis pechueli*, Dewitz, and *C. rosa*, Hew., which are evidently two distinct species; and *Crenidomimas concordia*, Hopff., the mimic of the last two species. Also two notable species of the genus *Aphnæus*—including the female, so rarely taken in this genus—*Acræa natalica*, Boisd., and *A. anemosa*, Hew., with two remarkable moths showing a close mimetic resemblance to them. The exhibitor further stated that his collection should prove interesting as regards seasonal forms, especially in the Acræinæ and Pierinæ, of which he showed additional examples. He suggested that the brilliant dry season phases of *A. induna*, Trim., had been evolved, by stress of circumstance at that time of year, from a duller coloured phase, such as, in this region, we still find in the wet season, when the struggle is not so keen.—A discussion of seasonal forms in these species followed, in which the President, Prof. E. B. Poulton, Dr. F. A. Dixey, Mr. G. A. K. Marshall, and other Fellows joined.—H. Rowland-Brown, M.A., *Hon. Secretary*.

The South London Entomological and Natural History Society. —*October* 11*th*, 1906.—Mr. Robert Adkin, F.E.S., President, in the chair.—Mr. Kaye exhibited a specimen of the extremely rare Thyrid, *Draconia rusina*, from Trinidad, resembling an irregularly injured leaf, the surface of which had been eaten by larvæ.—Mr. Sich, the pupæ of *Pieris daplidice*, and a photograph of the larva by Mr. Tonge; they were from Geneva ova.—Mr. Step, a larva, probably of *Prodenia littoralis*, found feeding inside the skin of a banana.—Mr. Jäger (1) fine series of dark green and light yellow forms of *Bryophila muralis*, from Starcross; (2) *Heliothis peltigera*, bred from South Devon larvæ; (3) *Agrotis vestigialis*, with unusually clear white markings, taken at sugar at Starcross; with (4) specimens of *Laphygma exigua*.—Mr. R. Adkin, a series of *Peronea permutana*, reared from larvæ feeding in *Rosa spinosissima*, from Wallasey.—Mr. South (1) nearly full-grown larvæ of *L. exigua*, feeding on plantain, dandelion, and groundsel; they were from ova deposited by a female taken at Kingston by Mr. Richards; (2) *Euchloë cardamines*, from larvæ fed on wallflower; for Mr. Hayward (3) a *Cabera pusaria*, leaden grey in colour, and the

transverse lines obsolete; (4) a dark form and a red form of *Xylophasia monoglypha*; (5) an almost black *Tæniocampa incerta*; (6) a smoky grey *Cymatophora duplaris*; (7) a grey-brown *Grammesia trigrammica*, with only very faint transverse lines; (8) a unicolorous fuscous-brown *Ematurga atomaria*; and (9) several dark powdered and sprinkled forms of *Tephrosia crepuscularia*, from near Burton-on-Trent.—Mr. West (Greenwich), the extremely local hemipteron, *Liburnia lepida*, from Esher.—Mr. Barnett, varied forms, including var. *flavescens*, of *Xanthia fulvago*, from Wimbledon.—Mr. Hy. J. Turner, two extremely large *Argynnis aglaia* females, from Gavarnie, Pyrenees, with two males from the Alps, extremely small; also var. *eris*, with typical forms of *A. niobe*.—Messrs. Main, Dennis, and Lucas, a large number of photographic slides of ova, larvæ, and imagines at rest.

October 26th. — The President in the chair. — Messrs. Harrison and Main exhibited bred series of large light forms and small dark forms of *Boarmia cinctaria*, from the New Forest; and of *Spilosoma fuliginosa*, from Cornwall. — Mr. Newman (1) a *Drepana falcula*, bred on Oct. 25th, with others; (2) long series of *Agrotis obelisca*, *Aporophila australis*, and *Anchocelis lunosa*, from the Isle of Wight; (3) very dark to very light forms of *L. exigua*; (4) very dark *A. segetum* and *A. saucia*; (5) *B. muralis* and *Polyommatus corydon*, taken on Sept. 16th in the Isle of Wight; (6) full-grown larvæ of *L. exigua*; (7) long series of var. *artaxerxes* of *P. astrarche*, from Aberdeen; (8) fine series of *Lobophora hexapterata*, from Bexley ova; and (9) short series of *Eupithecia togata* and *E. venosata*, from North Wales. — Mr. Tonge, a photograph of a pear-stem, with a ring of ova of *Malacosoma neustria*.—Mr. South, for Rev. W. Claxton, an *Aglais urticæ*, with nearly the whole fore wings whitish in ground colour; and for Mr. Hayward, a *Cerastis ligula* (*spadicea*), with the left antenna duplicated, but both shorter than that on the right.—Mr. Brown, a living *Mantis religiosa*, from South-east France.—Mr. McArthur, a *Mygale avicularis*, from South America, and an unusually large *Sirex gigas*, from Mus Tor, Dartmoor.—Mr. Barnett, short series of *E. rectangulata*, from Welling (all dark forms), and of *Hyria muricata*, from Wanborough. — Mr. West (Greenwich), short series of the until recently very rare Apions, *A. astragalis* and *A. sanguinea*, from Oxford.—Mr. Edwards, pupa of *Manduca atropos*, from Shooter's Hill. — Dr. Chapman, specimens of *L. argus* (*ægon*), from North-west Spain, very large, pale beneath, with fine red borders above. —Mr. Adkin, a series of somewhat suffused specimens of *Acronycta leporina*, bred from Abbot's Wood larvæ.—Mr. Kaye, several broods of *Hemerophila abruptaria* from dark parents, and gave results of the breeding.—Mr. Turner read a paper, "Further Notes on the genus *Coleophora*," and showed life-histories of *C. badiipennella*, *C. gryphipennella*, *C. artemisiella*, *C. argentula*, and *C. genistæ*. — Hy. J. Turner, *Hon. Rep. Sec.*

City of London Entomological and Natural History Society.—*October 2nd*, 1906.—Mr. H. M. Edelsten exhibited a series of *Leucania favicolor*, including a canary-coloured specimen.—Mr. T. H. L. Grosvenor, *Lycæna icarus*, from Witherslack, having black dots on fringes, as in *L. adonis*.—Mr. E. Harris, a scorpion from the Gold Coast, measuring about 10½ inches in length.—Mr. A. Harrison, *Hadena contigua*, *Diphthera orion* and *Scotosia undulata* bred from New Forest parents;

also *Geometra smaragdaria*, lacking usual white hair on fore wings.—Mr. G. H. Heath, ova of *Laphygma exigua*.—Mr. A. W. Mera, *Cucullia asteris*, bred from larvæ found on sea-aster on Essex marshes.—Mr. L. W. Newman, *Papilio machaon*, from Wicken, with red coloration in all the lunules on hind wings, *Acronycta rumicis* var. *salicis*, from Barnsley, and *Macaria liturata* var. *nigrofulvata*, from Delamere.—Mr. L. B. Prout, on behalf of Mr. G. B. Oliver, melanic specimens of *Acidalia subsericeata* and *A. marginepunctata*, from North Cornwall.—Mr. V. E. Shaw, a series of *Scoria dealbata*, Wye Downs, June, 1906, *Deilephila livornica*, Torquay, June 2nd, 1906, and *Tapinostola bondii*, Folkestone, July 10th, 1906.—S. J. Bell, *Hon. Sec.*

Birmingham Entomological Society.—*June 25th*, 1906.—Mr. G. H. Kenrick in the chair.—Mr. J. Simkins showed a boxful of forced Sphingidæ, including *Acherontia atropos*, L., *Chærocampa elpenor*, L., and *C. porcellus*, L., from Kent, and various other species of continental origin.—Mr. A. H. Martineau, a small collection of Hymenoptera formed at Warwick by Mr. R. L. Thompson when a boy at school there. It included *Sapyga clavicornis*, L., *Agenia hircana*, F., *Odynerus sinuatus*, F., *Nomada borealis*, Zett., and other interesting species.—Mr. Gilbert Smith, a number of specimens of *Tetropium*, part of a large number he had reared from one batch in a tree-trunk. They proved to be 17 per cent. *gabrieli* and the rest *crawshayi*, and as, moreover, they paired *inter se*, it would appear that there is but one species, and not two, as supposed. The species would be called *gabrieli*, and *crawshayi* would be merely a form with darker femora. His opinion was that the darker femora appeared when the species had fed in fairly new moist wood, and the lighter femora when it had lived on older dry wood.—Colbran J. Wainwright, *Hon. Sec.*

RECENT LITERATURE.

Insect Pests of the Farm and Garden. By F. Martin-Duncan. Pp. 143, with 44 illustrations. 2s. 6d. net. London: Swan Sonnenschein & Co., Ltd. 1906.

After discussing, in Part i., insects and insecticides, the author, in Part ii., treats seriatim of a considerable number of small creatures injurious to plants of farm and garden. Notwithstanding the title of the book, mites of various kinds (Arachnida) are included in both parts. The species selected are mainly those treated in the pamphlets of the Board of Agriculture and Fisheries, which, we must confess to thinking, will better serve the purpose of the farmer or gardener. No doubt they will find the present book of much use also, but the author scarcely seems to speak, to our thinking, with sufficient directness and authority. Of the illustrations, the microscopical ones and some of those made from drawings are good; those of the Lepidoptera are, generally, poor. In the language are a number of solecisms—for instance, ocelli and tracheæ used as singular nouns, and ovæ for ova more than once.

W. J. L.

Entomology with Special Reference to its Biological and Economic Aspects. By JUSTUS WATSON FOLSOM, Sc.D. (Harvard). Pp. i–xvi, 1–485. With five plates (one coloured) and 300 figures in the text. London: Rebman, Limited. 1906.

CLASSIFICATION having been so thoroughly dealt with by Comstock, Sharp, and others, the author of the present volume on Entomology has treated his subject chiefly from the biological and economic sides. The thirteen chapters into which the contents of the book are divided are arranged as follows:—i. Classification (pp. 1–26); ii. Anatomy and Physiology (pp. 27–145); iii. Development (pp. 146–183); iv. Adaptations of Aquatic Insects (pp. 184–192); v. Colour and Coloration (pp. 193–215); vi. Adaptive Coloration (pp. 216–236); vii. Origin of Adaptations and of Species (pp. 237–251); viii. Insects in Relation to Plants (pp. 252–275); ix. Insects in Relation to Other Animals (pp. 276–306); x. Interrelations of Insects (pp. 307–344); xi. Insect Behavior (pp. 345–365); xii. Distribution (pp. 366–392); xiii. Insects in Relation to Man (pp. 393–408). There is also an important list of entomological literature (pp. 409–466), grouped under subject headings and chronologically arranged. The author estimates that there now exist something like 100,000 titles, and he has selected those that appeared to him to be most generally useful and accessible.

The book is abundantly illustrated, the figures in the text being exceedingly good. One of the five plates is coloured, and represents cases of protective mimicry among butterflies.

The author claims to have incorporated a good many facts that have not hitherto appeared in text-books, and we think that in this he is justified. Among other observations that attract our attention are the following:—"Pictet, by feeding larvæ of *Vanessa urticæ* on the flowers instead of the leaves of the nettle, obtained the variety known as *urticoides*" (p. 196); and again, on p. 200: "Pictet has recently found, however, that humidity, acting on the caterpillars of *Vanessa urticæ* and *V. polychloros*, has a conspicuous effect on the coloration of the butterflies. Thus, when the caterpillars were fed for ten days with moist leaves, the resulting butterflies had abnormal black markings on the wings, and the same results followed when the larvæ were kept in an atmosphere saturated with moisture."

Unsuitable food certainly causes stunted growth. Where larvæ can manage, under such conditions, to struggle through and finally attain the imago state, the imagines are usually dwarf and the markings on the wings are sometimes more or less abnormal. In the case of *V. urticæ*, larvæ fed on hop produce very small butterflies, often veritable pigmies.

With regard to classification, we ought, perhaps, to note that the system adopted is practically that of Brauer. Thysanura and Collembola, however, rank as separate Orders. The earwigs (Dermaptera) are treated as a family of Orthoptera. Platyptera, of Packard and Carpenter, less the stoneflies (Plecoptera), takes the place of Corrodentia, Brauer. The Embiidæ are here included in Platyptera, and Packard's Mecaptera is retained for the scorpion flies, but the form Mecoptera is used. Rhynchota gives place to Hemiptera.

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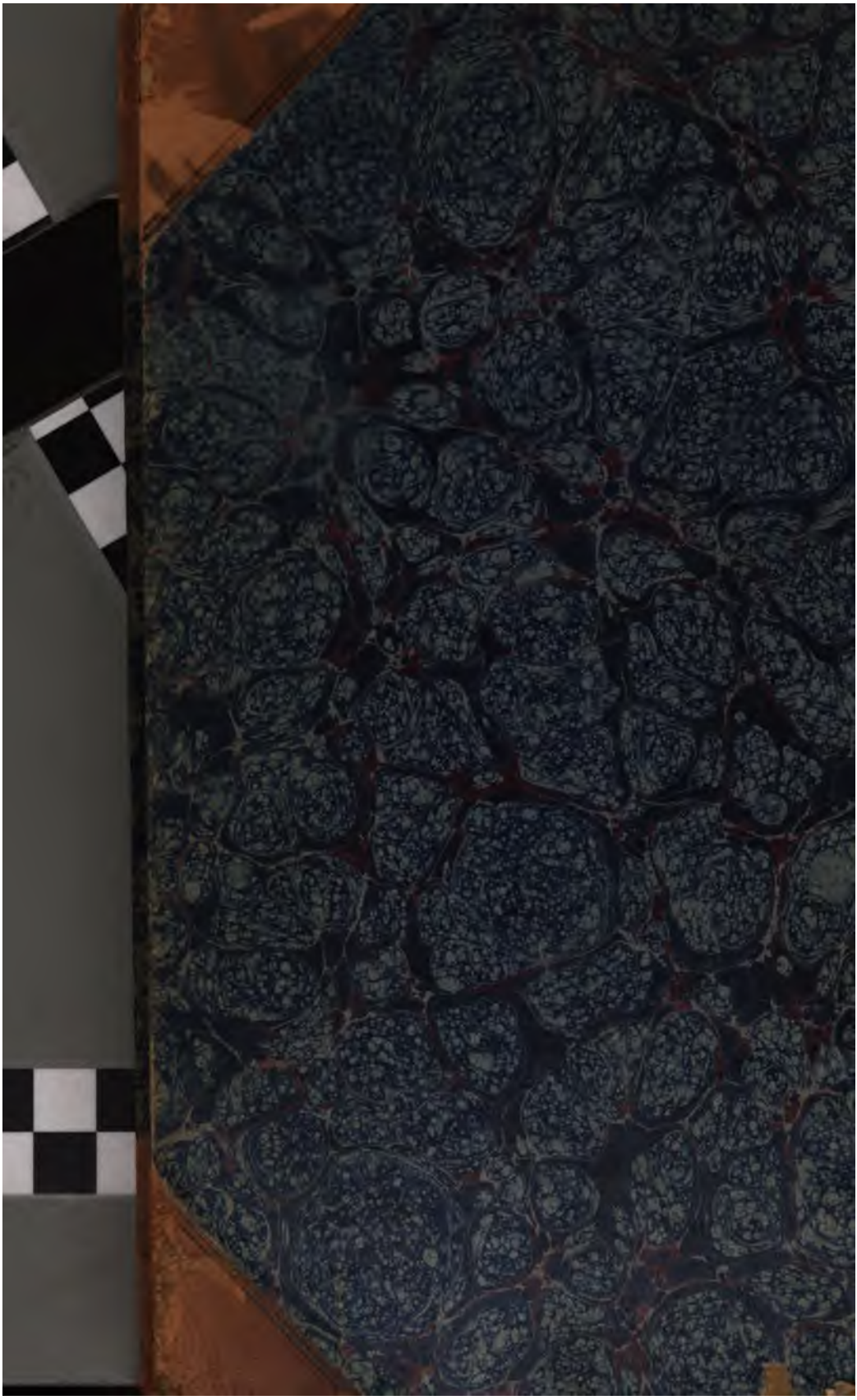
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